**Edition 1, SW Release 3.0.49 and higher, January 2006**

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**Step-by-step guide to install and configure Quadro basically.**

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# About this Guide

The QuadroE1/T1 Manual is divided into two parts:

- **Manual-I: Installation Guide**
  gives step-by-step instructions to provision the Quadro and configure the phone extension with the Epygi SIP Server. After successfully configuring the Quadro, a user will be able to make SIP phone calls to remote Quadro devices, make local calls to the PSTN and access the Internet from devices connected to the LAN.
- **Manual-II: Administrator's Guide** explains all QuadroE1/T1 management menus. It includes the available call codes and a list of all System Default Values, too

Quadro's Graphical User Interface introduces the Quadro's graphical user interface and explains all recurrent buttons.

Administrator's Graphical User Interface explains each of the Administrator's management on the main page of the Quadro management.

Quadro's Call Codes describes the Quadro's call codes that enable the user to navigate through Quadro's services from a phone handset.

Quadro's Auto Attendant Services explains the operation of the Quadro's auto attendant and lists the call codes that may be used to enter the auto attendant.

Appendix: System Default Settings lists all factory defaults.

Appendix: Glossary defines some technical terms.

Appendix: Software License Agreement includes the terms and conditions of using the Quadro's hardware and software.

# Quadro's Graphical User Interface

## Administrator's Main Page

After logging in as an administrator, the page **Quadro Management** is displayed. Here the administrator may access the following settings and perform the following actions:

Fig. II-1: Quadro Administrator's page

**System Menu**

- System Configuration Wizard
- Internet Configuration Wizard
- StatusIP Routing Configuration
- Configuration Management
- Update Configuration
- Events
- Time/Date Settings
- Mail Settings
- Firmware Update
- Networking Tools
- Diagnostics
- Automatic Provisioning
- Features
- Upload Language Pack

**Telephony Menu**

- Call Statistics
- SIP Settings
- H323 Settings
- RTP Settings
- NAT Traversal Settings
- Line Settings
- E1/T1 Settings
- Gain Control
- Call Routing
- VoIP Carrier Wizard
- RADIUS Client Settings
- Dial Plan Settings

**Users Menu**

- User Management

1) Change Admin Password

**Internet Uplink Menu**

- PPP Dial Settings
- ISP Authentication Settings
- Firewall and NAT
- Filtering Rules

**LAN Services Menu**

- DNS Settings
- DHCP Settings for the LAN Interface

**Registration Form**

(in menu tree only)

**Logout**

The functional button **Renew Wan IP Address** appears on the administrator's main **Quadro Management** page if the Quadro device acts as a DHCP client. The **Renew WAN IP Address** button is used to get a new WAN IP address for example when the Quadro moves to another network.

The functional button **Establish Your Internet Connection Now** respectively **Terminate Your Internet Connection Now** appears on the Quadro Management page if PPPoE is used as the WAN interface protocol.

The button **Please Check Your Pending Events** will be displayed on the administrator **Main Menu** page if any new system events exist. The link leads to the **Events** page that can also be accessed from the System menu.

The list of **Users currently logged into the system** is seen in the lower right corner of the Administrator's Main Menu. Information about the IP address of a user, the username used to log in and the time until the next automatically logout is provided herein. The idle session timeout is to 20 minutes. If no action is performed during that time, user will be automatically moved to the Login page and will be requested to login again.

The link **Refresh in** appears in the lower right corner beside the field displaying the number of seconds until the next refresh. It is used to perform a manual reload of the page. If a page with a Refresh counter is left open, the session time-out counter will be updated periodically and the logout timeout will never expire.

The current version of the Quadro's firmware and of its boot loader is shown in the lower right corner of the administrator's main menu, followed by the list of users currently logged into the system. Information about IP addresses users accessed Quadro from, the username of the logged-in user and the time until the next automatic logout is provided here. The idle session timeout is set to 20 minutes. If no action is done during that time, the user automatically will be moved to the login page and will be requested to login again.

## Recurrent Buttons

| Button | Description |
|---|---|
| Previous | This button leads back to the previous page of a fixed sequence of pages (used mainly in wizards). |
| Next | This button leads onward to the next page of a fixed sequence of pages (used mainly in wizards). |
| Cancel | This button discards the latest, not yet confirmed entries. |
| Finish | This is the last button of a fixed sequence of pages that completes and saves the entries of the whole sequence. |
| Help | This button opens the help page belonging to the currently active Quadro management page. |
| IP-Clipboard | This button opens a window where the last inserted IP addresses are listed. It is a kind of clipboard that helps the user to make quick selection of an IP address in case it has been already used in the past, thus to avoid typing it again. The clipboard can hold up to 10 IP addresses, a new IP address will replace the oldest one from the list. |

| Button | Description |
|---|---|
| Back | This button leads back to the page you have been on before. |
| Ok | This button confirms an operation you started before. |
| Yes | This button confirms an operation you chose before. |
| No | This button discards an operation you chose before. |
| Save | This button saves the settings modified on the currently active management page. |
| SIP Clipboard | This button opens a window where the last inserted SIP addresses are listed. It is a kind of clipboard that helps the user to make quick selection of a SIP address in case it has been already used in the past, thus to avoid typing it again. The clipboard can hold up to 10 SIP addresses, a new SIP address will replace the oldest one from the list. |

## Recurrent Functional Buttons

In connection with tables, the following buttons - among others - usually occur:

| Functional Button | Description |
|---|---|
| **Add** | Allows adding a new record to the displayed table. A new page will be displayed to enter any new settings. |
| **Edit** | Allows modifying the settings of the record selected by its checkbox. Normally only one record may be selected. A new page will be displayed to enter the modified settings. |
| **Delete** | Deletes the selected entry(s) of a table. A warning message will demand a confirmation before deleting an existing entry. |
| **Select All** | Selects all table entry(s)for example for further deletion. |
| **Inverse Selection** | Inverses an existing selection of table entry(s). If no entries are selected, clicking the button will select all records. |
| **Refresh in...** | May occur in the upper right corner of a page. It displays the number of seconds remaining until the next refresh of the page and it may be used to reload the page manually. |

Most of the tables offer the option to sort the entries in ascending or descending order by clicking the headings of the columns. A small arrow beside the column heading will show the direction of sorting - upward or downward. The entries of the table can be selected by the assigned checkboxes - one at a time, for the most part - in order to edit or delete them.

## Entering a SIP Addresses correctly

Calls over IP are implemented based on Session Initiating Protocol (SIP) on the Quadro. When making a call to a destination that is somewhere on the Internet, SIP address must be given.

SIP addresses have to be specified in one of the following formats:

"display name" <username@ipaddress:port>
"display name" <username@ipaddress>
username@ipaddress:port
username@ipaddress
username

The display name and the port number are optional parameters in the SIP address. If a port is not specified, 5060 will be set up as the default one. The range of valid ports is between 1024 and 65536.

A flexible structure of wildcards is allowed. In comparison with a wildcard, the "?" character stands for only one unknown digit and the "*" character stands for any number of any digits.

Particularly the following combinations can be used for your convenience:

- *@ipaddress - any user from the specified SIP server
- username@* - a specified user from any SIP server
- *@* - any user from any SIP server

**Please Note:** Wildcards are available for caller addresses only. No wildcard characters are allowed for called party addresses.

**Attention:** Wildcards are available for caller addresses only (for called party addresses no wildcard characters are allowed).

# Administrator's Menus

## System Menu

Fig. II-1: System Menu in Dynamo theme

Fig. II-2: System Menu in Plain theme

## System Configuration Wizard

The **System Configuration Wizard** is the helpful tool for the administrator to define the Quadro's Local Area Network settings and to specify regional configuration settings to make Quadro operational in its LAN. The **System Configuration Wizard MUST be run upon Quadro's first startup** to make sure that it works properly in its network environment. The Wizard allows navigating through the following basic configuration parameters and settings:

- System Configuration (see below)
- DHCP Settings for the LAN Interface
- Regional Settings and Preferences (see below)

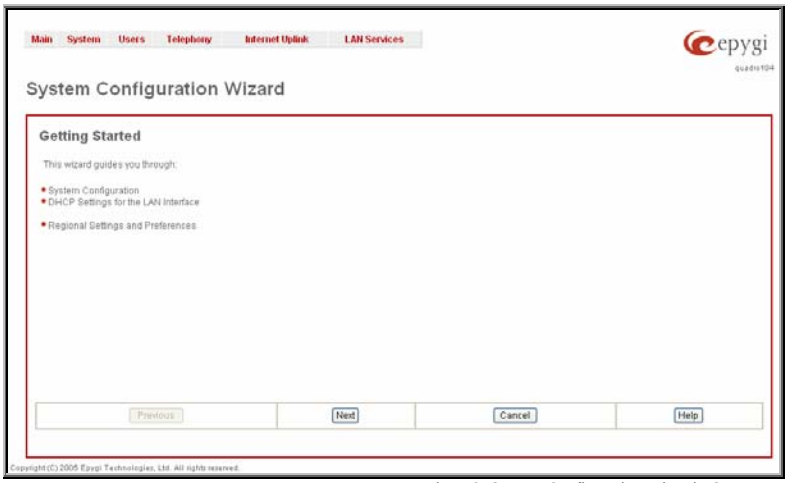



Fig. II-3: System Configuration Wizard - Start page

DHCP Settings for LAN are described in the chapters below while LAN configuration and regional settings will be described in the current chapter.

**Please Note: It is strongly recommended to leave the factory default settings if their meanings are not fully clear to the administrating person.**

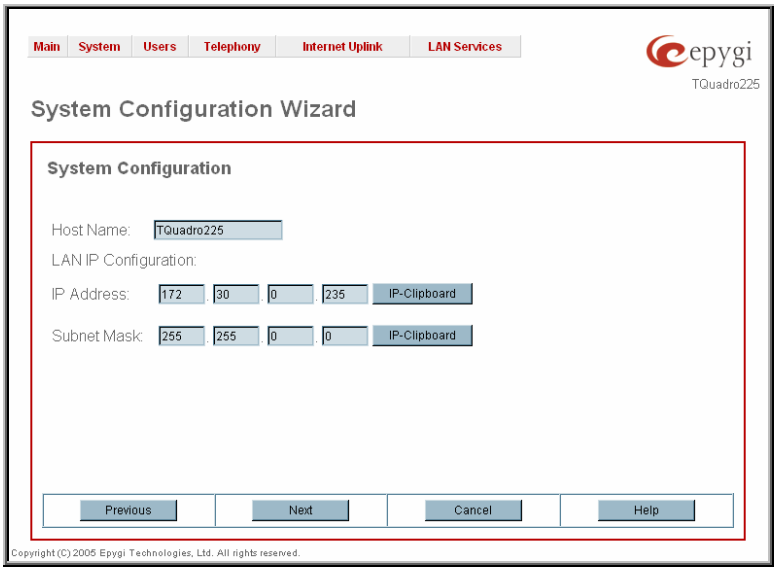



Fig. II-4: System Configuration Wizard - System Configuration page

The **System Configuration** page contains the host name, IP address and Subnet Mask information about the Quadro LAN interface. These settings make Quadro available to the internal network.

The **System Configuration** page offers the following input options:

**Host Name** requires a host name for the Quadro device.

**IP Address** requires the Quadro host address for the LAN interface.

**Subnet Mask** requires the Quadro hosts' Subnet Mask.

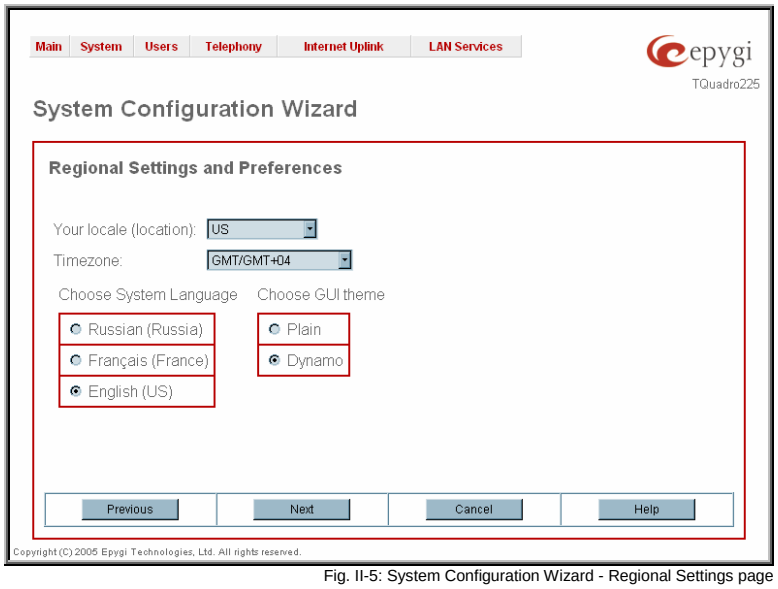



Fig. II-5: System Configuration Wizard - Regional Settings page

The **Regional Settings and Preferences** are used to select settings specific to the location of the Quadro.

This is important for the functionality of the voice subsystem.

The **Regional Settings and Preferences** page has two drop down lists to select the **Location** (country) and a corresponding **Timezone** and a manipulation radio button group to choose:

- **System Language** – selection is available only when custom Language Pack has been uploaded and is used to enable custom language for system voice messages or turn back to default (English).
- **GUI Theme** - selection used to select the GUI theme style of the web based configuration pages.

## Internet Configuration Wizard

The **Internet Configuration Wizard** is the helpful tool for the administrator to configure the WAN interface settings and to adjust Quadro's connectivity with an external network. The **Internet Configuration Wizard MUST be run if it is desired for Quadro to be connected to the Internet**. The Wizard allows navigating through the following basic configuration parameters and settings:

- Uplink configuration (see below)

For WAN Interface protocol PPPoE:

- PPP Configuration
- WAN Interface Configuration
- DNS Settings
- ISP Authentication Settings
- PPP Dial Settings

For WAN Interface protocol Ethernet:

- WAN IP Configuration
- WAN Interface Configuration
- DNS Settings

The **Switch to Auto Provisioning** link moves you to the Automatic Provisioning page where Quadro can be configured by the automatically provisioning mechanism.

All the settings of the **Internet Configuration Wizard** are described in the chapters below except those for the IP settings, which will be described in this chapter.

**Please Note: It is strongly recommended to leave the factory default settings if their meanings are not fully clear to the administrating person.**

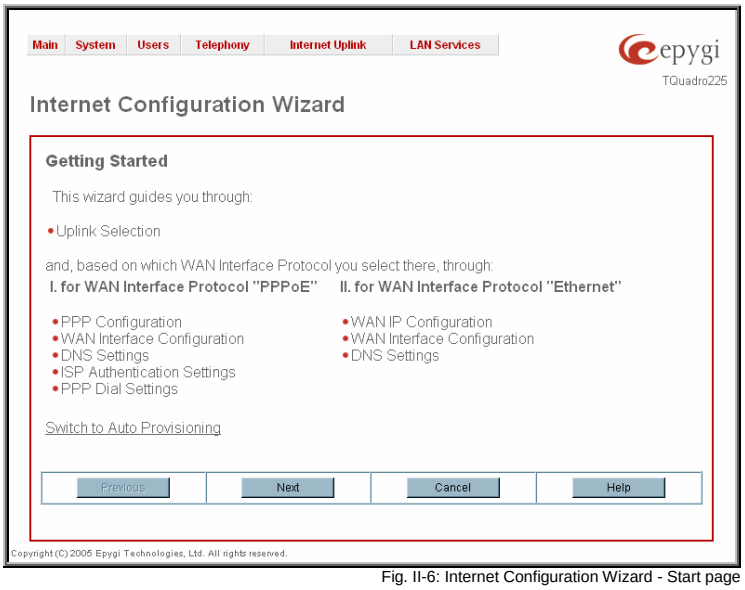



Fig. II-6: Internet Configuration Wizard - Start page

The **Uplink Configuration** page allows to select the Quadro's WAN interface connection type and its bandwidth settings. These settings make Quadro available to the external network.

Depending on the Uplink Interface Protocol selection, the page following the **Uplink Configuration** page is different. Thus if **PPPoE** is selected, the next page will be **PPP Configuration**, while selecting **Ethernet** will bring up the **WAN IP Configuration** page.

The **Uplink Configuration** page offers the following components:

The **WAN Interface Protocol** radio buttons are used to choose between Point-to-Point Protocol over Ethernet (**PPPoE**) and **Ethernet**. Selection depends on the requirements of the ISP (Internet Service Provider).

**PPPoE** - turns on the PPP over Ethernet connection type.

**PPPoA** – selection is only present when corresponding interfaces are present on the Quadro and are used to turn on the PPP over ADSL/G.SHDSL connection type.

**Ethernet** - turns on the Ethernet connection type.

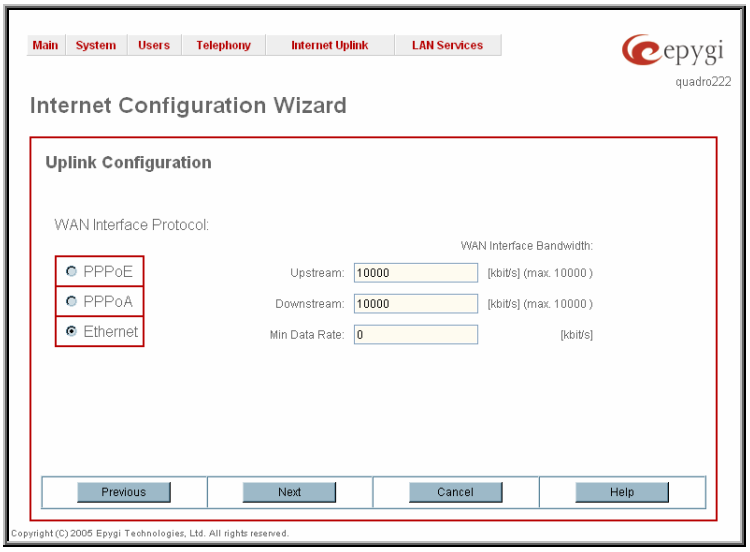



Fig. II-7: Internet Configuration Wizard - Uplink Configuration page

The **WAN Interface Bandwidth** settings allow the specification of the upstream and downstream speeds in kbit/s, helping to assure the quality of IP calls. An IP call looses the voice quality if there will be no available bandwidth. In case of reaching the borders of bandwidth, another IP call will be declined.

The bandwidth provided by the ISP has to be specified in the text fields **Upstream Speed** and **Downstream Speed**. The default entry in both fields is 10000, the maximum bandwidth of a 10 MB Ethernet. But most providers offer a smaller bandwidth than these 10000 kbit/s.

The bandwidth required by an IP call depends on the codecs used and is listed in the tables below:

**Required Bandwidth for Standard Packets:**

| Packet Size in msec. | Needed bandwidth in kbit/s using the Codecs: | | | | | |
|---|---|---|---|---|---|---|
| | G.711u/G.711a | G.726-16 | G.726-24 | G.726-32 | G.726-40 | G.729a |
| 10 | 105 | 58 | 66 | 73 | 81 | 50 |
| 20 | 84 | 37 | 45 | 52 | 60 | 29 |
| 30 | 77 | 30 | 38 | 45 | 53 | 22 |
| 40 | 73 | 26 | 34 | 42 | 50 | 18 |
| 50 | 71 | 24 | 32 | 40 | 48 | 16 |
| 60 | 70 | 23 | 30 | 38 | 46 | 15 |

**Required Bandwidth for Encrypted Packets** (in the case a VPN is used):

| Packet Size in msec. | Needed bandwidth in kbit/s using the Codecs: | | | | | |
|---|---|---|---|---|---|---|
| | G.711u/G.711a | G.726-16 | G.726-24 | G.726-32 | G.726-40 | G.729a |
| 10 | 148 | 98 | 105 | 117 | 123 | 92 |
| 20 | 105 | 59 | 65 | 74 | 80 | 49 |
| 30 | 91 | 43 | 52 | 60 | 66 | 35 |
| 40 | 84 | 37 | 45 | 53 | 61 | 29 |
| 50 | 80 | 33 | 41 | 48 | 56 | 25 |
| 60 | 77 | 30 | 37 | 46 | 53 | 22 |

The **Min Data Rate** text field requires the amount of upstream bandwidth that ought to remain for data applications even if voice applications use the entire available upstream bandwidth. The value selected here needs to be smaller than the upstream bandwidth and is measured in kbit/s.

If PPPoE is selected as the WAN Interface Protocol then the **PPP Configuration** page is opened next.

The **PPP Configuration** page offers the following components:

**IP Address Assignment** radio buttons are used to configure the IP address for the Quadro device:

- **Dynamic IP Address** - switches to the dynamic IP address assignment mechanism.
- **Fixed IP Address** - switches to the fixed IP address assignment mechanism.

**Fixed IP Address** requires entering the user defined IP address for the Quadro device on the WAN interface.

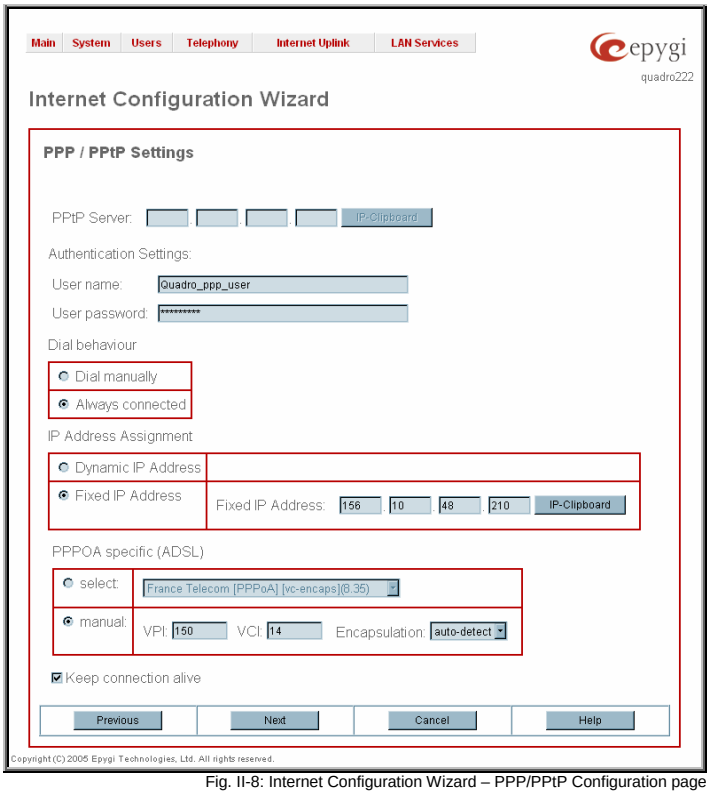



Fig. II-8: Internet Configuration Wizard – PPP/PPtP Configuration page

The **WAN IP Configuration** page only is displayed if Ethernet has been selected to be the uplink protocol. It offers the following components:

The **Assign automatically via DHCP** radio-button selection switches to automatic retrieval of the WAN IP address from a DHCP server at the ISP/uplink.

**Please Note:** DHCP referred to here is the one running on the provider's side and not the Quadro's personal DHCP server.

The **Assign Manually** radio-button switches to the manual adjustment of IP settings. This selection requests the following parameters:

**IP Address** requires the IP address for the Quadro WAN interface.

**Subnet Mask** requires the subnet mask for the Quadro device WAN interface.

**Default Gateway** requires the IP address of the router all packets are sent to, for example, the router of the provider.

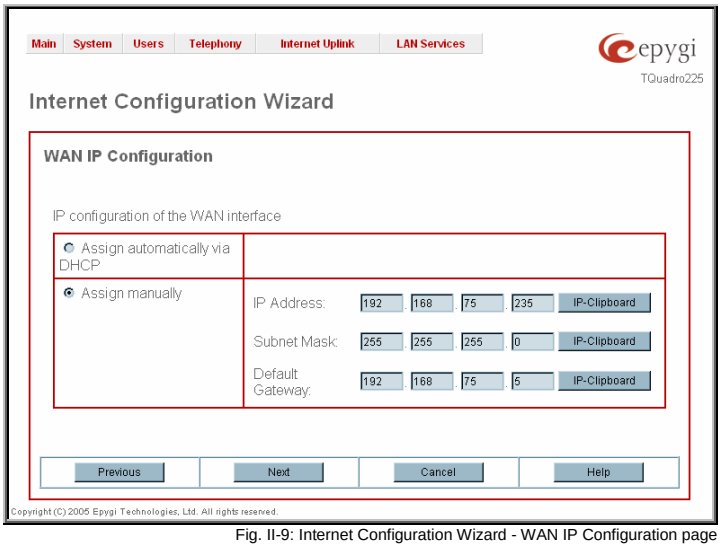



Fig. II-9: Internet Configuration Wizard - WAN IP Configuration page

The **WAN MAC Address Configuration** page may be used to modify the MAC address of the Quadro. This might be necessary, if the ISP (Internet Service Provider) requires a certain MAC address, for example, for authentication. The page offers the following components:

**MAC Address Assignment** manipulation radio-buttons:

- **This Device** turns to the default MAC address of the Quadro.
- **User Defined** requires user defined MAC Address.

**MTU** drop down list allows to select the maximum packet size on the Ethernet (in bytes). MTU is used to fragment the packets before transmitting them to the network. MTU preferred value is dependent on the Ethernet connection type. The default MTU size is 1500 Bytes for Ethernet and 1400 Bytes for PPPoE.

Fig. II-10: Internet Configuration Wizard - WAN MAC Address Configuration page

## Status

The system status window displays non-editable tables providing extensive status information about Quadro: General Information, Network Status, Lines Status, Memory Status, Hardware Status, SIP Registration Status and H323 Registration Status. The links on this page lead to device Transfer Statistics, user mailboxes and supplementary services configuration pages.

The **System Status** page has several tables providing system information.

## General Information

The **General Information** page includes the following information:

- **Uptime duration -** Period Quadro is on since last reboot.
- **Device Hostname -** Quadro device host name.
- **Quadro Operating System -** Quadro operating system version.
- **Application Software -** Software and file system versions of the Quadro.
- **Boot Loader -** Quadro boot loader version.
- **DSP Software -** Quadro DSP software version and the date of build.
- **Preinstalled Languages** – field is present only when multiple languages are preinstalled on the device and indicates the system default languages.
- **Language Pack** – field is present only when custom language pack is uploaded and indicates its version.

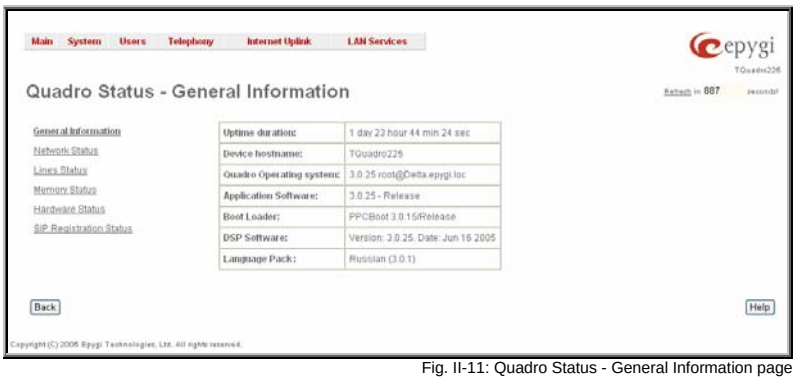



Fig. II-11: Quadro Status - General Information page

## Network Status

The **Network Status** page includes the following information about **Interfaces**:

**Interface Name** lists the Network interfaces available on the Quadro (LAN and WAN).

**IP Address** lists the IP addresses corresponding to each network interface.

**Subnet Mask** lists the subnet masks corresponding to each network interface.

**Properties** lists either the MAC address corresponding to each network interface on the Quadro.

**Monitor** includes links to survey LAN and WAN traffic correspondingly.

- Received Bytes
- Received Packets
- Received Errors
- Received Drop Errors
- Received Overrun Errors
- Received MultiCast Packets
- Transmitted Bytes
- Transmitted Packets
- Transmitted Errors
- Transmitted Drop Errors
- Transmitted Carrier Errors
- Transmitted Collisions

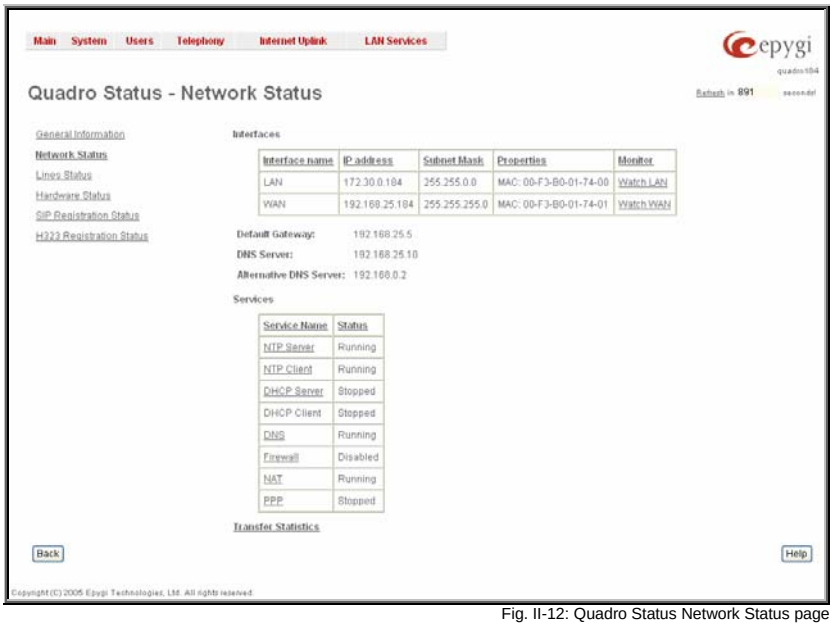



Fig. II-12: Quadro Status Network Status page

When opening the corresponding interface statistics window, no traffic values are displayed at first. Then every one minute, traffic statistics will be updated. The tables serve as a kind of counter.

**DNS Server**, **Alternative DNS Server** and **Default Gateway** - displays the Quadro settings corresponding to what has been configured with the System Configuration Wizard.

**Services** (NTP Server and Client, DHCP Server and Client, DNS, Firewall, NAT, PPP) statuses: **stopped** or **running**.

**Transfer Statistics** - link to the Transfer Statistics page.

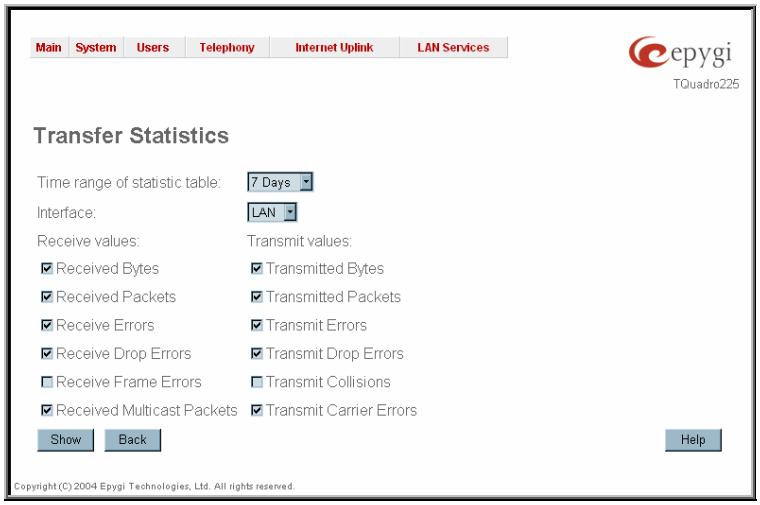



Fig. II-13: Transfer Statistics page

The **Transfer Statistics** page allows a user-defined statistic table depending on the transmit/receive value (criteria), interface type and time period. It contains the following components:

**Time Range of statistic table** - the drop down list includes the period(in days) statistics data is to be collected and the corresponding diagram charts are to be built.

**Interface** - the drop-down list offer the values:

- **WAN** - Wide Area Network (WAN) events only
- **LAN** - Local Area Network (LAN) events only

The area **Receive Values**:

- **Receive Bytes** - number of received bytes
- **Receive Packets** - number of received Ethernet packets
- **Receive Errors** - number of received packets containing errors
- **Receive Drop Errors** - number of received packets that have been discarded
- **Receive Overrun Errors** - number of received overrun errors that occur when the receive buffer is not large enough to hold all incoming packets. This error mostly appears because of a slow receiving system.
- **Receive MultiCast Packets** - number of received broadcast packets

The area **Transmit Values**:

- **Transmit Bytes** - number of transmitted bytes
- **Transmit Packets** - number of transmitted Ethernet packets
- **Transmit Errors** - number of transmitted packets containing errors
- **Transmit Drop Errors** - number of transmitted packets that have been discarded
- **Transmit Carrier Errors** - number of transmit carrier errors that occur because of a defective or lost connection on the Ethernet link
- **Transmit Collisions** - number of transfer errors that occurred during a simultaneous packet transmission from both sides

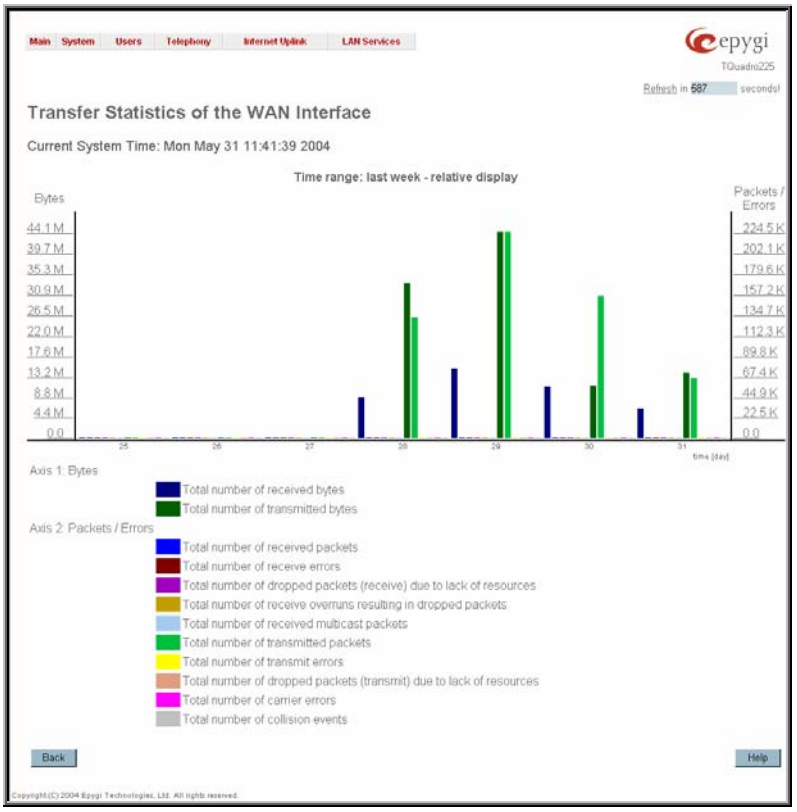



Fig. II-14: Transfer Statistics Diagram Chart

To show the **Transfer Statistics Diagram Charts**, select the desired criteria and click **Save** to generate the corresponding chart.

## Lines Status

The page **Quadro Status** - **Lines Status** shows the current status of the extension and E1/T1 trunk. Since only one line information is displayed at a time, the **Phone1** and **E1/T1 Trunk** buttons serve to navigate through the lines information.

The **Lines Status** table displayed for **Phone1** lines includes a group of static and dynamic parameters. Static parameters are displayed always, while dynamic parameters only appear whenever an event takes place on the extension.

Static Parameters:

**Extension** - the extension number of the selected telephone line

**Display Name** – the corresponding name

**Phone State** - On hook or off hook

**Number of Active Calls** – that are currently present on the phone.

Dynamic Parameters:

**Call State** – the current state of the extension (in call, waiting, busy, call out, ring in etc.)

**Caller Party** – this parameter appears whenever a call is received and indicates the caller extension, the IP address or a phone number depending on the call type

**Called Party** – this parameter appears whenever a call is placed and indicates the destination extension, the IP address or a phone number depending on the call type

**Call Type** – shows whether the call is **Internal** or **External** and whether it is a **PSTN**, **PBX** or **IP Call**

**Call Start Time** – call start date and time

**Call Duration** – current call duration

**RX Codec** shows the codec used to encrypt the incoming packets. **TX Codec** shows the codec used to encrypt the outgoing packets. If RX and TX codecs are the same, one **Codec** field will be displayed instead.

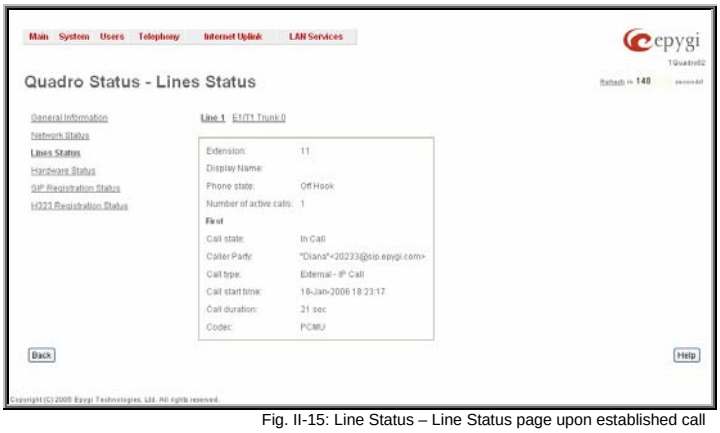
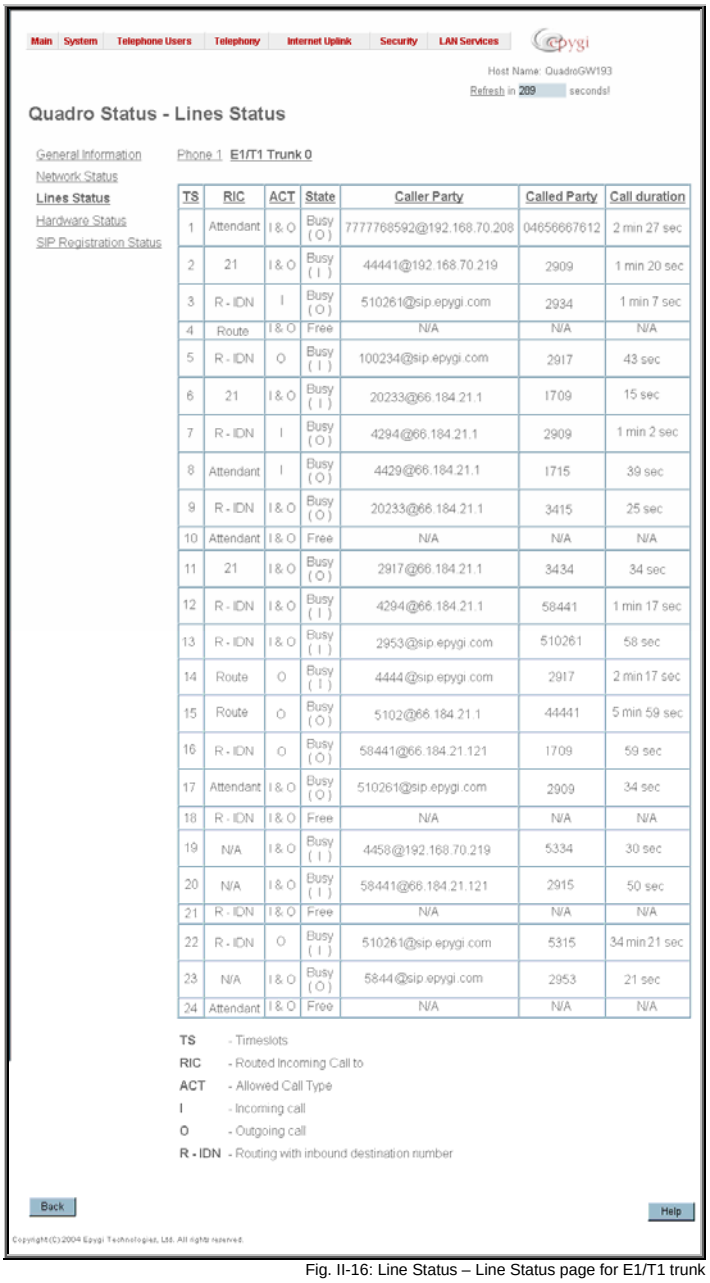



Fig. II-15: Line Status – Line Status page upon established call




| TS | RIC | ACT | State | Caller Party | Called Party | Call duration |
|---|---|---|---|---|---|---|
| 1 | Attendant | I & O | Busy ( O ) | 7777768592@192.168.70.208 | 04656667612 | 2 min 27 sec |
| 2 | 21 | I & O | Busy ( I ) | 44441@192.168.70.219 | 2909 | 1 min 20 sec |
| 3 | R - IDN | I | Busy ( O ) | 510261@sip.epygi.com | 2934 | 1 min 7 sec |
| 4 | Route | I & O | Free | N/A | N/A | N/A |
| 5 | R - IDN | O | Busy ( I ) | 100234@sip.epygi.com | 2917 | 43 sec |
| 6 | 21 | I & O | Busy ( I ) | 20233@66.184.21.1 | 1709 | 15 sec |
| 7 | R - IDN | I | Busy ( O ) | 4294@66.184.21.1 | 2909 | 1 min 2 sec |
| 8 | Attendant | I | Busy ( O ) | 4429@66.184.21.1 | 1715 | 39 sec |
| 9 | R - IDN | I & O | Busy ( O ) | 20233@66.184.21.1 | 3415 | 25 sec |
| 10 | Attendant | I & O | Free | N/A | N/A | N/A |
| 11 | 21 | I & O | Busy ( O ) | 2917@66.184.21.1 | 3434 | 34 sec |
| 12 | R - IDN | I & O | Busy ( I ) | 4294@66.184.21.1 | 58441 | 1 min 17 sec |
| 13 | R - IDN | I & O | Busy ( I ) | 2953@sip.epygi.com | 510261 | 58 sec |
| 14 | Route | O | Busy ( I ) | 4444@sip.epygi.com | 2917 | 2 min 17 sec |
| 15 | Route | O | Busy ( O ) | 5102@66.184.21.1 | 44441 | 5 min 59 sec |
| 16 | R - IDN | O | Busy ( O ) | 58441@66.184.21.121 | 1709 | 59 sec |
| 17 | Attendant | I & O | Busy ( O ) | 510261@sip.epygi.com | 2909 | 34 sec |
| 18 | R - IDN | I & O | Free | N/A | N/A | N/A |
| 19 | N/A | I & O | Busy ( I ) | 4458@192.168.70.219 | 5334 | 30 sec |
| 20 | N/A | I & O | Busy ( I ) | 58441@66.184.21.121 | 2915 | 50 sec |
| 21 | R - IDN | I & O | Free | N/A | N/A | N/A |
| 22 | R - IDN | O | Busy ( I ) | 510261@sip.epygi.com | 5315 | 34 min 21 sec |
| 23 | N/A | I & O | Busy ( O ) | 5844@sip.epygi.com | 2953 | 21 sec |
| 24 | Attendant | I & O | Free | N/A | N/A | N/A |

Fig. II-16: Line Status – Line Status page for E1/T1 trunk

The **Line Status** for **E1/T1 Trunk** displays the list of available timeslots (in E1 mode, 30 active timeslots both for CAS and CCS signaling types; in T1 mode, 24 timeslots for CAS signaling and 23 timeslots for CSS signaling type) and their settings (**Route Incoming Call to**, **Allowed Call Type** and **Timeslot State**). When Timeslot is in the call, information about call direction (incoming or outgoing), **Caller Party**, **Called Party** and **Call Duration** is displayed.

**E1/T1 Channel Usage Statistics** link refers to the page where traffic statistic table for E1/T1 channel can be composed. It contains the following components:

**Time Range of statistic table** - the drop down list includes the periods (days) for that statistics data is to be collected and for that a diagram chart is to be built.

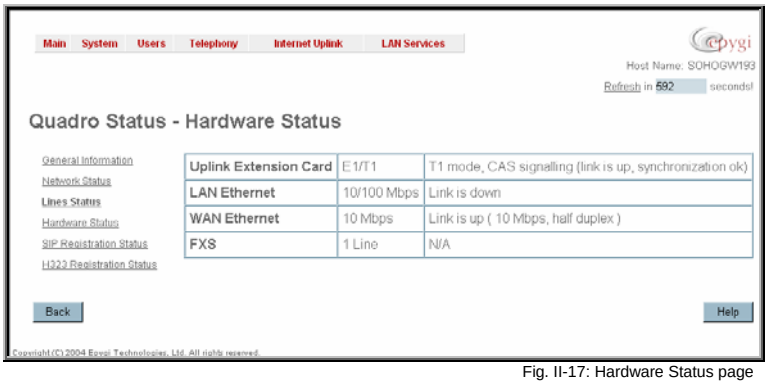
**Incoming Calls** – indicates incoming E1/T1 call statistics in the output chart.

**Outgoing Calls** - indicates outgoing E1/T1 call statistics in the output chart.

**Maximum Active Calls** – indicates E1/T1 active calls with maximal duration.

To show the **E1/T1 Channel Usage Statistics** select the desired criteria and click **Show** to build the corresponding chart (looks like Transmit Statistics Diagram, see Network Status).

## Hardware Status




| | | |
|---|---|---|
| Uplink Extension Card | E1/T1 | T1 mode, CAS signalling (link is up, synchronization ok) |
| LAN Ethernet | 10/100 Mbps | Link is down |
| WAN Ethernet | 10 Mbps | Link is up ( 10 Mbps, half duplex ) |
| FXS | 1 Line | N/A |

Fig. II-17: Hardware Status page

The **Hardware Status** table displays a list of the hardware devices present and currently available on the Quadro board. The hardware device version number and additional comments about its state are indicated here.

## SIP Registration Status

The **SIP registration Status** is a table displaying the SIP registration status of the Quadro extensions. The table contains a list of all the registered extensions of Quadro, information about SIP registration states for them, addresses of SIP servers where they are registered (if so), registration date and time, as well as SIP registration names. By clicking on the row heading, the table will be sorted by the selected column. Upon sorting (ascending or descending), arrows will be displayed next to the column heading.

The links inside the table link you to the User Management – Edit Entry page where the extension's SIP registration settings may be altered.

The **Detected Connection Type** field displays the connection type Quadro currently is acting in (direct connection or behind NAT). If Quadro is acting behind NAT, the NAT machine IP address is also displayed.

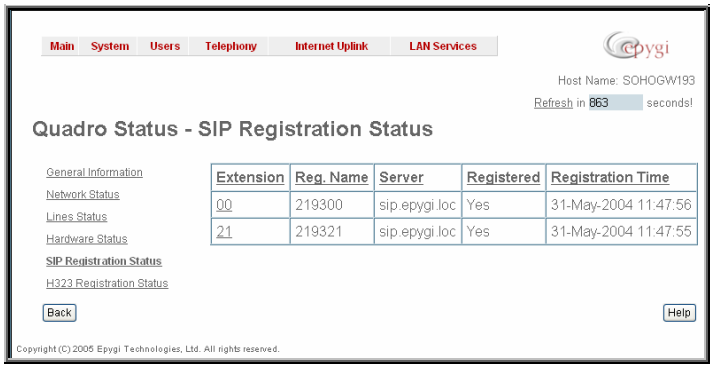



Fig. II-18: SIP Registration Status page

## H323 Registration Status

The **SIP registration Status** is a table displaying the H.323 registration status of the Quadro extensions. The table contains a list of all the registered extensions of Quadro, information about H.323 registration states for them, addresses of H.323 gatekeepers where they are registered (if so), registration date and time, as well as H.323 registration names. By clicking on the row heading, the table will be sorted by the selected column. Upon sorting (ascending or descending), arrows will be displayed next to the column heading.

The links inside the table link you to the User Management – Edit Entry page where the extension's H.323 registration settings may be altered.

The **Detected Connection Type** field displays the connection type Quadro currently is acting in (direct connection or behind NAT). If Quadro is acting behind NAT, the NAT machine IP address is also displayed.

Fig. II-19: H.323 Registration Status page

## IP Routing Configuration

**Routing** is used to relay information across the Internet from a source to a destination. Along the way, at least one intermediate node is typically encountered. Routing is often confused with bridging, which may seem to accomplish precisely the same thing to the casual observer.

Quadro's **IP Routing** service allows to route IP packets from one destination to another (or to a specified router) through Quadro.

The **IP Routing Configuration** page is used to make IP Static and IP Policy routes for IP packets routing and has two tables.

**IP Static Routes** are used to forward IP packets from the Network, where the Quadro is connected, to the specified destination.

The **IP Static Routes** table displays all established IP static routes with their parameters: **Target State** for the state of the route (enabled or disabled), **Actual State** for the state of the route connection (up, down or erroneous), **Route To** for the subnet where the incoming packets should be routed and **Via IP Address** for the router IP address incoming packets should be routed through.

**Add** opens the **Add IP Static Route** page where a new static route can be established.

**Enable/Disable** are used to activate/deactivate selected route(s). At least one route should be selected in order to use these functions, otherwise the error message appears: "No record(s) selected."

Main System Users Telephony Internet Uplink LAN Services
epygi
IP Static Routes
IP Static Routes IP Policy Routes
Enable Disable Add Edit Delete Select all Inverse Selection
Target State Actual State Route to Via IP Address
enabled up 155.52.21.0/24 192.168.75.5
enabled up 10.33.56.24/32 192.168.75.24
disabled down 192.168.75.0/24 172.30.59.54
Back
Help

Fig. II-20: IP Static Routing table

The page **Add IP Static Route** offers the following components:

**Route To** requires the IP address and subnet mask of the destination the IP packet ought to be forwarded to.

**Via IP address** requires the IP address of the subsequent router for IP packet forwarding to the specified destination.

**Attention:** The rule with the longest subnet (smallest IP range) will take effect when having two or more IP Static routing rules with the coinciding subnets.

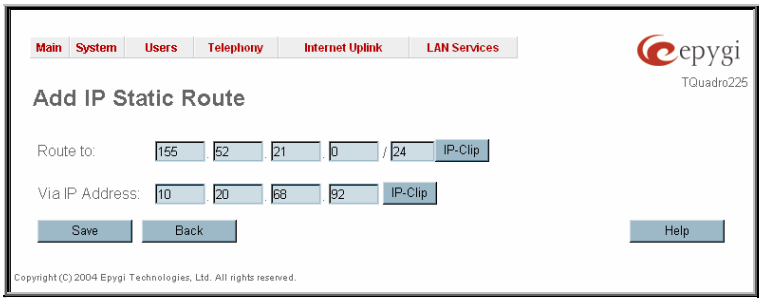



Fig. II-21: Add IP Static Routing page

**IP Policy Routes** allow IP packets forwarding to the specified router depending on the source IP address as well as defining the priority for the current routing rule.

The **IP Policy Routes** table displays all specified IP policy routes with their parameters: **Target State** for the state of the route (enabled or disabled), **Actual State** for the state of the route connection (up, down or erroneous), **Priority** for the route priority, **Route From** for the subnet, routed packets come from and **Via IP Address** for the router IP address incoming packets should be routed through.

**Add** opens the page **Add IP Policy Route** to establish a new policy route.

**Enable** and **Disable** are used to activate or to deactivate the selected route(s).

**Raise** and **Lower Priority** are used to increase or to decrease the priority of the selected policy route(s) by one. At least one route should be selected to use these functions, otherwise the error message appears: “No record(s) selected.”

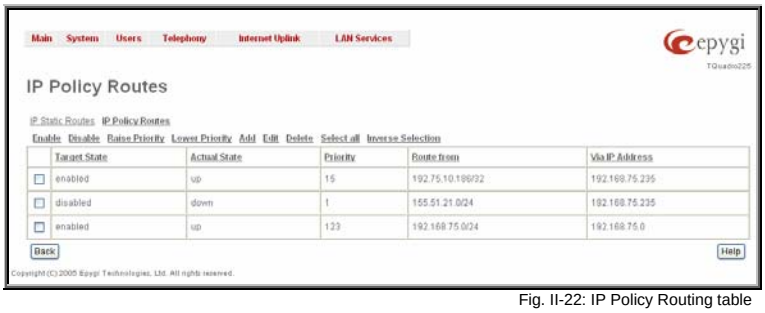



Fig. II-22: IP Policy Routing table

The page **Add IP Policy Route** offers the following input options:

**Priority** requires a numeric value (from 1 to 252) to define the priority of the routing rule. The lower the number, the sooner the routing rule will take effect (higher priority).

**From** requires the packet source IP address and subnet mask of the specified destination to match with the rule.

**Via IP address** requires the IP address of the subsequent router for IP packet forwarding.

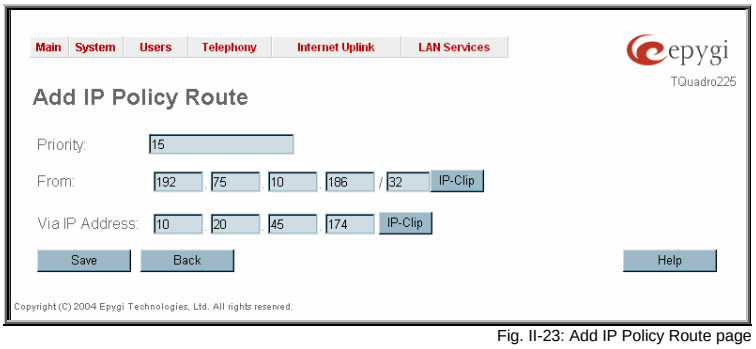



Fig. II-23: Add IP Policy Route page

The **Enable** and **Disable** functional buttons are used to activate or to deactivate the selected route(s). At least one route should be selected to use these functions, otherwise the error message appears: “No record(s) selected.”

**To Add an IP Static Route**

1. Select the **IP Static Routes** link on the **Routing Configuration** page.
2. Press the **Add** button on the **IP Static Routes** page. The **Add Entry** page will appear in the browser window.
3. Enter the destination IP address and subnet mask in the **Route To** text fields. Use the **IP-Clip** button to select a previously entered IP address.
4. Enter the router IP address into the **Via IP Address** text fields.
5. Press the **Save** button to make the static route with these settings.

**To Add an IP Policy Route**

1. Select the **IP Policy Route**s link on the **Routing Configuration** page.
2. Press the **Add** button on the **IP Policy Routes** page. The **Add Entry** page will appear in the browser window.
3. Specify the policy routing rule priority in the **Priority** text field.
4. Enter the packet source IP address and subnet mask in the **From** text fields. Use the **IP-Clip** button to select a previously entered IP address.
5. Enter the router IP address into the **Via IP Address To** text fields.
6. Press the **Save** button to make the policy route with these settings.

## Configuration Management

The **Configuration Management** assists the administrator to manage the system configuration settings and voice data, i.e., to backup and download the settings to the PC and then to upload and restore them back to the Quadro. Additionally this page gives a possibility to restore the factory default configuration settings.

The **Backup & Download all config & voice data** link generates a backup file with all configuration settings and user uploaded greeting messages and opens a file chooser window for immediate download to the user PC.

**Attention:** Configuration and voice data cannot be backed up if the size of voice data is too large. In this case, to be able to backup configuration and voice data on the Quadro, please remove some user defined system messages (by restoring the default ones, see chapter Administrators Login at Feature Codes), or remove some extensions from the User Management table.

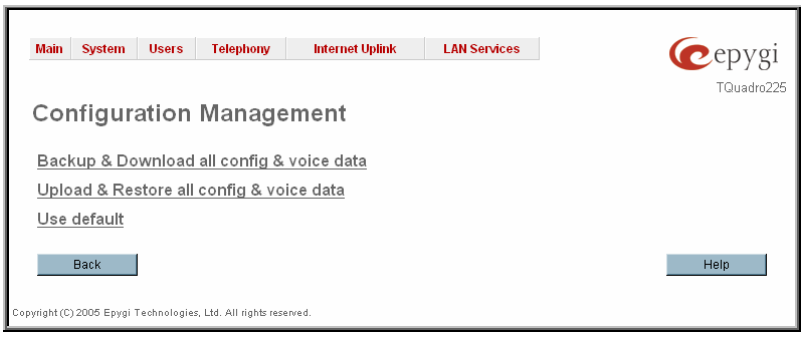



Fig. II-24: Configuration Management page

The **Upload & Restore all config & voice data** link opens a page with the **Browse** button, (which opens a file chooser to select a backed-up file) and a **Configuration to Upload** field requiring the file path to upload and to restore it immediately. Pressing **Save** will restore the selected backup file, and delete all current user defined greetings and replace configuration settings.

The **Use Default** functional button resets all configuration settings and restores the board's factory default configuration. By restoring the default configuration you will replace your current one and reboot the device. You will not be automatically redirected to the GUI start page. After the successful reboot you will need to enter into the management and login again to access the Quadro's configuration. A warning message will ask you to confirm your selection before restoring the default configuration.

**Please Note:** Unlike the factory default settings restore procedure initialized from the Reset button on the Quadro board, this link will keep the following data:

- Call Statistics
- Transfer Statistics
- System Events
- Feature Keys
- Device Registration state

## Update Configuration

The **Update Configuration** allows to automatically or interactively update Quadro's configuration, as well as to download a legible and editable configuration file, make necessary changes and upload it back to the system. This particularly allows to use parts of the configuration of one Quadro on another Quadro with some changes done prior to uploading the new configuration. Service is mainly used by Quadro reseller, distributor, ISP or carrier.

**Attention:** It is strongly recommended to consult with technical support center before making changes on this page. Incorrect settings here may corrupt current configuration. Page consists of the following components:

**Server** and **Server Port** text fields require IP address or Host name and the port number of the server configuration will be downloaded from.

**Update Method** drop down list indicates the connection type used to download the configuration (ftp, tftp, http or https).

**Enable Version Check** checkbox selection enabled version verification before configuration is being downloaded.

**Attention:** Disabling **Enable Version Check** checkbox may cause incompatibility problems on the device.

**Update Interval Selection** manipulation radio-button group is used to select the frequency of configuration check/update performed on the Quadro:

- **Check/Update at boot time** – with this option, new available configuration will be checked/updated each time after Quadro boots.
- **Check/Update manually** – with this option, configuration check/upload will be performed only by manual selection.
- **Check/Update time/date scheduled** – with this option new available configuration will be checked/updated periodically dependent on the selected time and/or weekday. This selection enables **Time Based** and **Weekday Based** checkboxes. Selecting one or both of them allows to define the time and the weekday, when configuration check/update will be automatically performed.

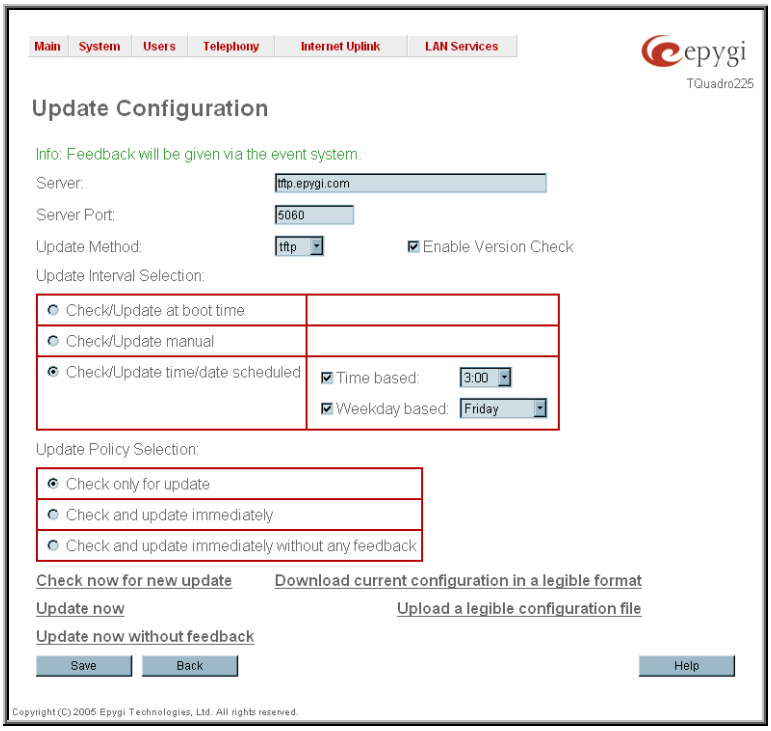



Fig. II-25: Upload Configuration page

**Update Policy Selection** manipulation radio-button group is used to select the operation performed on the selected:

- **Check only for update** – with this option, system will only perform checking of the availability of new suitable configuration and will log corresponding event in the Events table (depending on configuration in Events Settings).
- **Check and update immediately** - with this option, system will check the availability and correspondingly update the new configuration and will log corresponding event in the Events table (depending on configuration in Events Settings).
- **Check and update immediately without any feedback** - with this option, system will check the availability and correspondingly update the new configuration but will not log any events on this.

**Check now for new update** functional button performs manual checking of the availability of new suitable configuration and logs corresponding event in the Events table (depending on configuration in Events Settings).

**Update now** functional button performs manual checking and update of the availability new configuration and logs corresponding event in the Events table (depending on configuration in Events Settings).

**Update now without feedback** functional button performs manual checking and update of the availability new configuration and does not log any events on this.

**Download current configuration in a legible format** link refers to the **Configuration Summary** page where necessary configuration part or a complete configuration can be defined and downloaded or viewed.

**Configuration Summary** page is used to define the necessary configuration part and to download it to PC or to view it directly in the browser.

In the text field on this page configuration part need to be downloaded should be specified. Pressing **Start generate a legible configuration file** will start parsing the configuration structure of the device. Progress will be seen in the area below.

**Cancel generation process** button appears immediately configuration generation procedure starts and is used to stop it.

**Download generated configuration** button becomes available once legible configuration generation is over and is used to download the generated file to the PC in the plain text format. Necessary changed can be done in the downloaded configuration file and then uploaded back to the system.

Fig. II-26: Configuration Summary page

**Attention:** Make sure the changes you have done in the downloaded legible configuration file are valid and will not corrupt the system when being uploaded back to device.

**View generated configuration** button becomes available once legible configuration generation is over and is used to view the generated file directly in the browser.**Upload a legible configuration file** link refers to the page where configuration file can be uploaded in text format. **Browse** button in the opened page is used to browse the certain legible configuration file to be uploaded and updated to the system. Configuration files to be uploaded should be in the *.txt format, otherwise system error occurs. Configuration file upload progress will be displayed in the area below.

## Events

The **Events** page shows two tables and displays all system events that have occurred in one table and event settings in the other.

The **System Events** page may be accessed with **Events** link from the main menu. It lists information about system events that have occurred on Quadro. When a new event takes place, a record is added to the System Event table and a warning “Please check your pending events!” appears at the bottom of all management pages.

The system events and the warning message are visible only for the administrator. The warning link, (which leads directly to the **System Events** page) will disappear from the management pages if the administrator has marked all new events as read.

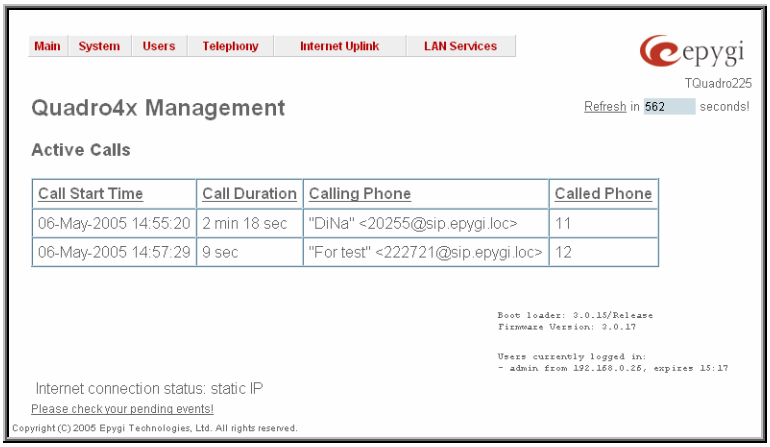



Fig. II-27: Event Warning on the Main Menu page

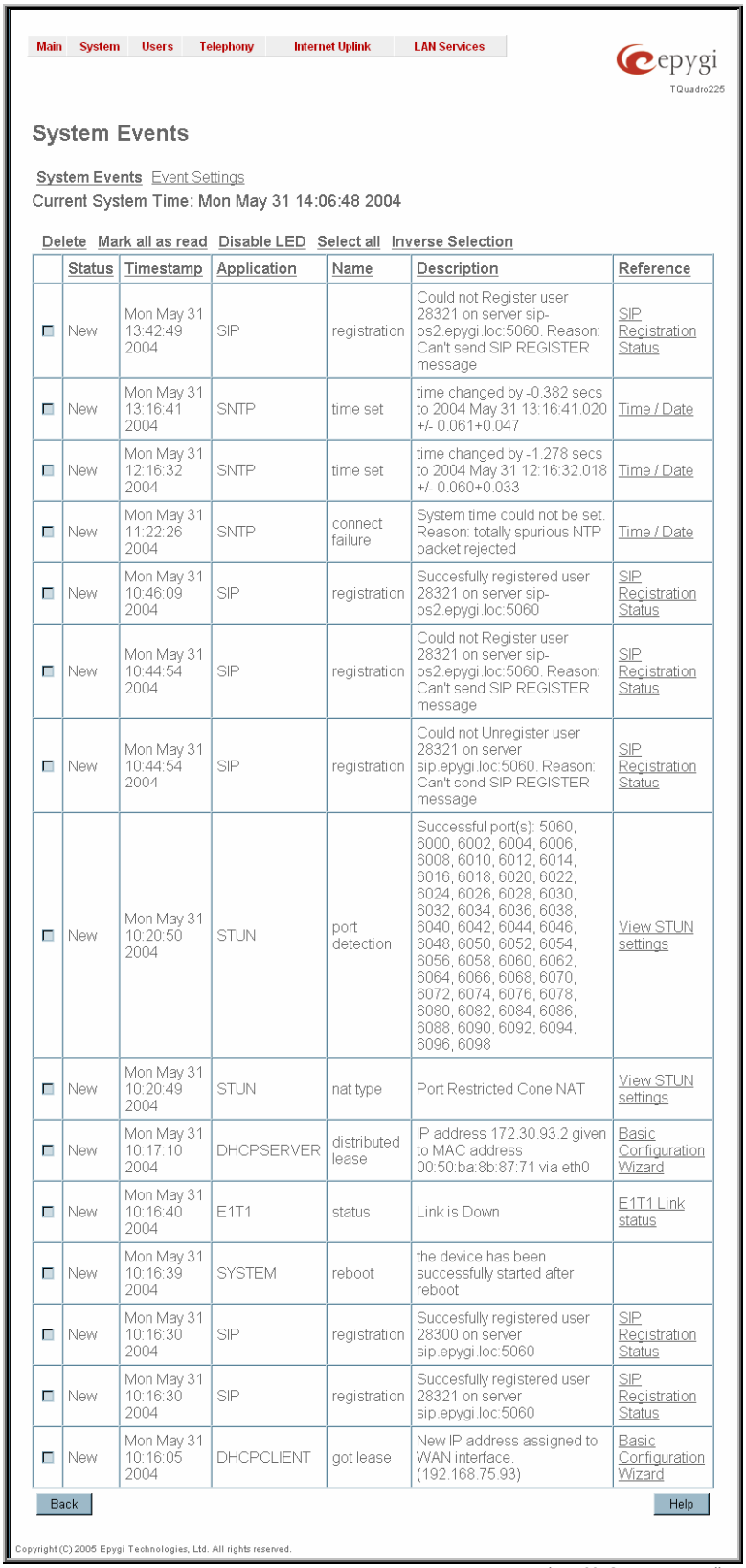

Main System Users Telephony Internet Uplink LAN Services
epygi
TQuadro225
System Events
System Events Event Settings
Current System Time: Mon May 31 14:06:48 2004
Delete Mark all as read Disable LED Select all Inverse Selection
Status Timestamp Application Name Description Reference
New Mon May 31 13:42:49 2004 SIP registration Could not Register user 28321 on server sip-ps2.epygi.loc:5060. Reason: Can't send SIP REGISTER message SIP Registration Status
New Mon May 31 13:16:41 2004 SNTP time set time changed by -0.382 secs to 2004 May 31 13:16:41.020 +/- 0.061+0.047 Time / Date
New Mon May 31 12:16:32 2004 SNTP time set time changed by -1.278 secs to 2004 May 31 12:16:32.018 +/- 0.060+0.033 Time / Date
New Mon May 31 11:22:26 2004 SNTP connect failure System time could not be set. Reason: totally spurious NTP packet rejected Time / Date
New Mon May 31 10:46:09 2004 SIP registration Succesfully registered user 28321 on server sip-ps2.epygi.loc:5060 SIP Registration Status
New Mon May 31 10:44:54 2004 SIP registration Could not Register user 28321 on server sip-ps2.epygi.loc:5060. Reason: Can't send SIP REGISTER message SIP Registration Status
New Mon May 31 10:44:54 2004 SIP registration Could not Unregister user 28321 on server sip.epygi.loc:5060. Reason: Can't send SIP REGISTER message SIP Registration Status
New Mon May 31 10:20:50 2004 STUN port detection Successful port(s): 5060, 6000, 6002, 6004, 6006, 6008, 6010, 6012, 6014, 6016, 6018, 6020, 6022, 6024, 6026, 6028, 6030, 6032, 6034, 6036, 6038, 6040, 6042, 6044, 6046, 6048, 6050, 6052, 6054, 6056, 6058, 6060, 6062, 6064, 6066, 6068, 6070, 6072, 6074, 6076, 6078, 6080, 6082, 6084, 6086, 6088, 6090, 6092, 6094, 6096, 6098 View STUN settings
New Mon May 31 10:20:49 2004 STUN nat type Port Restricted Cone NAT View STUN settings
New Mon May 31 10:17:10 2004 DHCPSERVER distributed lease IP address 172.30.93.2 given to MAC address 00:50:ba:8b:87:71 via eth0 Basic Configuration Wizard
New Mon May 31 10:16:40 2004 E1T1 status Link is Down E1T1 Link status
New Mon May 31 10:16:39 2004 SYSTEM reboot the device has been successfully started after reboot
New Mon May 31 10:16:30 2004 SIP registration Succesfully registered user 28300 on server sip.epygi.loc:5060 SIP Registration Status
New Mon May 31 10:16:30 2004 SIP registration Succesfully registered user 28321 on server sip.epygi.loc:5060 SIP Registration Status
New Mon May 31 10:16:05 2004 DHCPCLIENT got lease New IP address assigned to WAN interface: (192.168.75.93) Basic Configuration Wizard
Back
Help
Copyright (C) 2005 Epygi Technologies, Ltd. All rights reserved.

Fig. II-28: System Events list

The **System Events** table is the list of new and read system events. The table shows the **Status** of the event (new or read) as well as the name of the application the event refers to, event description, and the date when the event was received. For example, if the event has occurred due to incorrect mail sending or SIP registration, corresponding links will be seen in the **Reference** column of the table. There the administrator can view the detailed log for the event that has occurred.

The **System Events** page offers the following components:

**Current System Time** displays the local date and time on Quadro.

**Mark all as read** marks newly occurred events as read.

**Disable LED** switches off the LED flashing (if any do flash) on the board. A LED notification may appear (depending on the notification type given) in the page Events settings whenever a new event occurs.

Main System Users Telephony Internet Uplink LAN Services
epygi
TQuadro225
Event Settings
System Events Event Settings
Edit Select all Inverse Selection
Application Name Description Action
SYSTEM default configuration Default configuration has been created Display notification
PPP link down PPP has lost the link Do nothing
PPP link up PPP has established a connection Do nothing
PPP authentication failure password or user is wrong Flash LED
MAIL send failure could not send a mail Display notification
SNTP time set SNTP daemon corrected the system time Send mail
SNTP connect failure SNTP daemon could not reach the time server Send mail
IDS intrusion alert possible intrusion detected Send mail
SYSTEM reboot the device has been successfully started after reboot Display notification
SYSTEM rollback the rollback mechanism restored the old system configuration Flash LED
PPP general failure The PPP daemon got an error Display notification
SYSTEM usb A USB device has been (un)plugged Display notification
SYSTEM usb flash USB Flash device event Display notification
DHCPSERVER error DHCP Server Event Send mail
DHCPSERVER distributed lease DHCP Server Event Send mail
DHCPCLIENT error DHCP Client Event Send mail
DHCPCLIENT got lease DHCP Client Event Send mail
SYSTEM dyndns DynDNS Event Flash LED
SIP registration SIP Registration Event Flash LED
VPN tunnel broken One of the IPSec-VPN connections went down Display notification
VPN tunnel restarted Remote Side of an IPSec-VPN went down, currently trying to reconnect Display notification
VPN tunnel started An IPSec Tunnel is successfully started Display notification
STUN port detection STUN port detection Display notification
STUN nat type STUN NAT type detection Display notification
SYSTEM ip routing Could not add ip route Display notification
FIREWALL general failure Firewall Problem Report Display notification
SYSTEM software watchdog Executing escalation command Display notification
ISDN status ISDN BRI link status event Flash LED
ISDN encoding ISDN BRI encoding check event Flash LED
SYSTEM update Automatic Software Update Flash LED
Back
Help
Copyright (C) 2004 Epygi Technologies, Ltd. All rights reserved.

Fig. II-29: Event Configuration Settings page

Numerous circumstances may cause a certain application on Quadro to flag an event.

The page **Event Settings** lists all possible events on the Quadro and allows controlling the way of notification (action), if one of those events takes place.

Each entry in the events' table has its checkbox assigned to the row. By selecting the corresponding checkboxes, operations such as **Edit** may be done for one or more events.

**Edit** opens the **Edit Event Settings** page to modify the event action.

**Do Nothing** - Nothing will happen when the event occurs.
**Display Notification** - A notification link will be displayed on the bottom of all pages and a record is added into the **Events** table. The notification is executed as the link "Please Check you pending events!" that leads to the page **System Events**. This action also will take place if Flash LED or Send Mail has been selected, even if not selected explicitly.
**Flash LED** - The second LED (yellow) will be blinking once a second and a notification will be displayed on the bottom of all pages. For some events the LED will start flashing after a delay.
**Send Mail** - An e-mail with a notification about the new event and an event description in the mail body will be sent to the e-mail address specified in the Mail Settings page.

Actions that are not allowed for the selected event (like mail notification if the PPP link is down or the mail server has been misconfigured) are hidden. For multiple events editing, actions that do not fit at least to one of the selected events will be hidden.

If Quadro cannot get an IP address from the DHCP or PPP servers, or cannot register an extension on the SIP or Routing servers, or cannot reach an NTP server, it raises only one event for the entire period the action has failed, but continues to try. When the required action is successful,, Quadro raises an appropriate message.

The page **Edit Event Settings** offers the following input options:

**Application** displays the application the event refers to. **Multiple** is shown here, if more than one event has been selected for the action assignment.

**Name** displays the name of the event. **Multiple** is shown here, if more than one event has been selected for the action assignment.

**Description** displays additional information about the event. **Multiple** is shown here, if more than one event has been selected for the action assignment.

**Action** offers radio buttons to choose one of the actions to notify the Quadro administrator whenever the selected event(s) takes place.

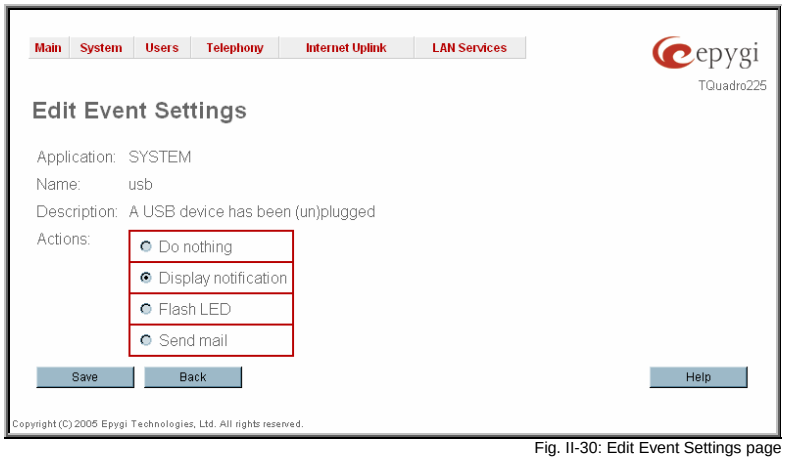



Fig. II-30: Edit Event Settings page

**To Assign an Action to the Event**

1. Select the checkbox of one or more events to assign an action to them.
2. Press the **Edit** button. The **Edit Event Settings** page appears.
3. Select an action type from the **Action** radio buttons to notify the administrator about the event in the desired way.
4. Press the **Save** button to submit the changes or use **Back** to abort the selected action.

## Time/Date Settings

The **Time and Date Settings** provide information about the current system time and date. The settings may be updated through the international time and date servers.

**Time** is used to set the local time (hour, minute).

**Date** is used to set the date (month, day, year).

**Timezone** provides a selection of world time zones and is used to select the local country time zone. Timezones are specified by GMT (Greenwich Mean Time) and by specific timezones for the United States and Canada.

**Enable Simple Network Time Protocol Server** enables the SNTP (Simple Network Time Protocol) server on Quadro, thus Quadro becomes the timeserver for its LAN.

**Enable Simple Network Time Protocol Client** enables the SNTP client on the Quadro, thus Quadro becomes a client to an external timeserver. The checkbox disables Date and Time drop down lists and enables the following parameters:

The **SNTP Servers** table lists all defined NTP Servers.

**Add** functional button opens an **Add NTP Server** page where a new NTP server can be defined. This page offers the **NTP Server** radio buttons that are used to choose between a manual and a predefined NTP server.

> **Manual** requires the NTP server's FQDN (Full Qualified Domain Name) or its IP address.
>
> **Predefined** is used to select the NTP server's host address from the drop down list, where the most common NTP servers are listed.

The **Move Up** and the **Move Down** functional buttons are used to sort NTP servers in the order they need to be accessed. If the NTP server on the first position in the **SNTP Servers** table does not answer, NTP server on the next position will try to be reached.

**Please Note:** Add another NTP server to the list if you feel defined NTP servers are not functional, i.e., the Quadro's date/time is not being updated automatically.

**Polling Interval** indicates the time interval for the periodical synchronization between timeserver and Quadro. It counts in hours.

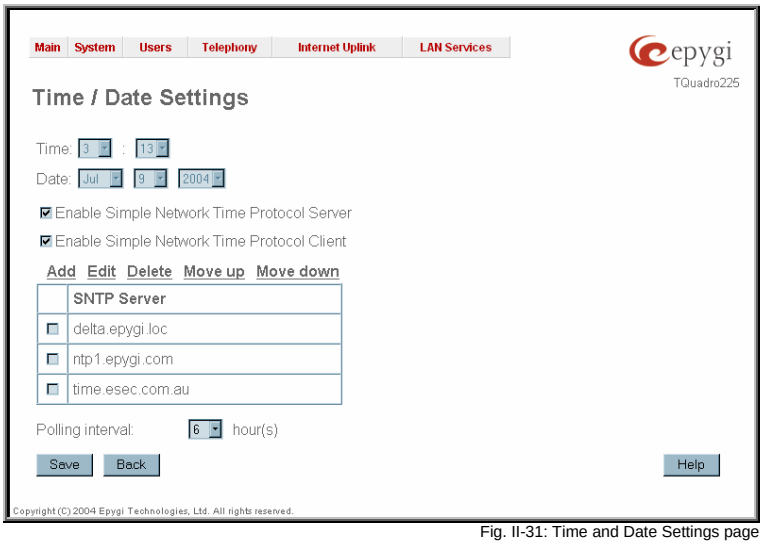



Fig. II-31: Time and Date Settings page

Fig. II-32: Add NTP Server page

**Attention: Time and Date Settings** will be reset if Quadro has lost power.

## Mail Settings

The **System Mail Settings** page gives a possibility to send warnings automatically about the board status or problems to the administrator. System events that require email notification are selected on the Events page. Besides, system mail has to be enabled and the SMTP server needs to be configured for voice message transmission to the extension user's mailing account.

**Enable** enables the system mail sending possibility and voice messages transmission to the extension user's mailbox.

**SMTP Host** requires the SMTP host IP address or domain name. The SMTP host needs to be configured to enable voice message transmission.

**Mail Sender Address** requires the source address for the Quadro notification emails. The email address defined here should be an existing valid email address registered on the selected SMTP server or should have permission to use that particular SMTP server for emails transmission.

**Mail Recipient Address** requires an active email address. The e-mail recipient here can be a Quadro administrator or someone responsible for network and system problems.

**Enable SMTP Authentication** has to be selected if the specified SMTP server requires an authentication. In this case, authentication **User Name** and **Password** configured on the SMTP server should be defined in the corresponding text fields.

**Send Test Mail** is used to initiate a test e-mail transmission. This button will be enabled if correct values have been submitted and saved on this page.

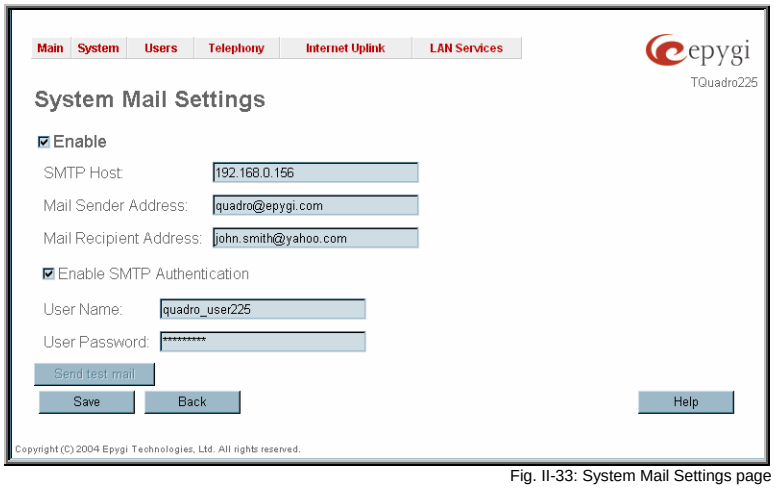



Fig. II-33: System Mail Settings page

**To configure the System Mail**

1. Enable the system mail sending by the **Enable** checkbox selection.
2. Update or set the SMTP host in the **SMTP Host** text field.
3. Update or set the e-mail sender address in the **Mail Sender Address** text field.
4. Update or set the e-mail address in the **Mail Recipient Address** text field.
5. Enable **SMTP Authentication** if it is required of the server.
6. Insert into the corresponding text fields an authentication **User Name** and a **User Password** defined by your SMTP server.
7. Press the **Save** button to submit these settings.
8. Use the **Send Test Mail** button to send a test e-mail with the configured settings.

## Firmware Update

This window allows to update the software of Quadro by installing new firmware called image. Users registered at Epygi will receive a notice when new firmware is available and will be able to download it from the Epygi Technical Support WEB page.

Updating a new firmware requires a perfectly working power supply. Therefore Quadro is provided with a battery (accumulator). If the battery is low or simply absent the “There is no battery or voltage is low” warning is displayed

**Please Note:** Installing new firmware will take about 15 minutes. During this time, the QuadroCS, telephony and Internet access will be disabled.
The firmware update will cause the loss of the following data:

- DHCP leases
- Transfer statistics
- Call statistics
- All pending events
- User specific GUI states
- All custom (user recorded) voice messages

The following main processes will be stopped during the firmware update and will be restarted afterwards:

- Voice Software
- Network Time Protocol Daemon
- Network Interface Statistic Daemon

**Please Note:** If you consider the Call Statistics entries in the displayed tables to be important, it is recommended to download them from the corresponding page prior to starting the Firmware Update.

**Next** will move you to the second page of Firmware Update where the image file should be selected.

Fig. II-34: Firmware Update page 1

The second page of **Firmware update** has the **Browse** button used to browse the image file, and the **Specify Image** text field that will display the selected image filename.

Pressing **Save** will start uploading the image file to the board. The next page will be displayed, showing the result of a verification of the image being burned.

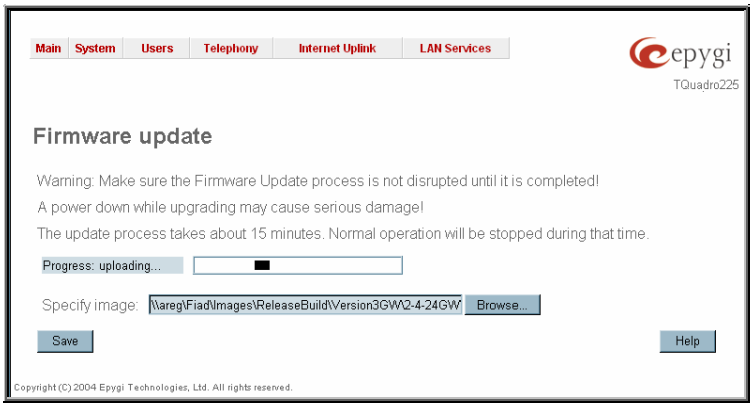



Fig. II-35: Firmware Update page 2

This page displays non-editable information about the image validity. The **Image Check** will display invalid if the image does not correspond to the hardware version.

The fields **Current Software Version** and **New Software Version** show the old software version and the version of the new image.

This page needs a confirmation to continue image updating. If you are sure that the image version is appropriate for your device press **Save**.

Fig. II-36: Firmware Check page

## Networking Tools

The **Networking Tools** provide the possibility to check the Internet connection.

**Ping** sends four ICMP (Internet Control Message Protocol) requests with a default size of 64 bytes to the destination (IP address or host name) specified in the text field **Ping Target**. The response times are logged, and the round trip time (the time required from being sent until being received again) is measured. The results are displayed in the lower area of the page: The minimum and maximum round trip time and its average, the percentage of lost and of received frames.

**Traceroute** checks the Internet connection by triggering the routers (hops) that are passed to reach the destination specified in the text field **Traceroute Target**. Trace routing gives feedback on the routers passed by packets on the way toward the destination and the round trip delay of packets to these routers.

**Attention**: No **Traceroute** is possible if a high priority Firewall has been enabled (see chapter Firewall and NAT).

For the purpose of tracerouting, several IP packets are sent out. UDP (User Datagram Protocol) is used to send packets and ICMP (Internet Control Message Protocol) is used to receive information about the routers. In their headers, the TTL (Time To Live) value increases from 1 to 30. When the first IP frame is received by the first router, its IP address will be returned in its acknowledgement

The second frame delivers the IP address of the second router and so on and so forth. The results of **Traceroute** are displayed on the lower area of the page.

**Ping Target** requires the destination (IP address or host name) for the ICMP request.

The **Ping** button starts pinging the specified ping target.

**Traceroute Target** is used to enter the IP address or host name of the destination to be trace routed.

The **Traceroute** button is used to process the router triggering to check the Internet connection.

In the field below the output of the Ping or Traceroute procedure is shown.

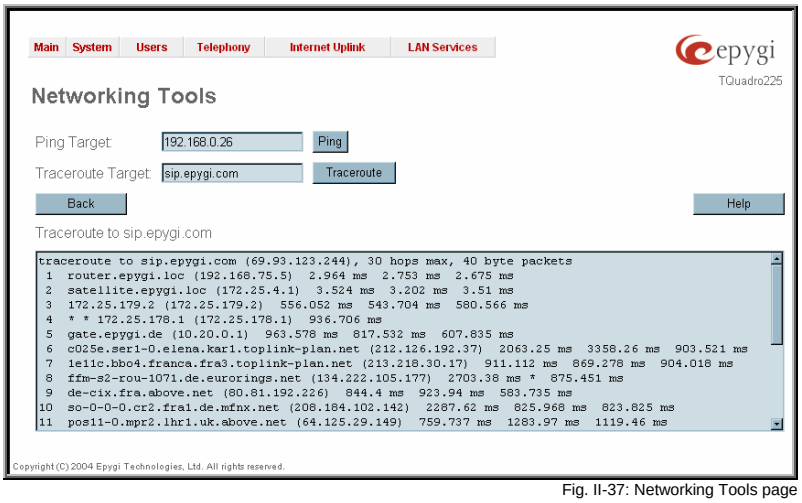

Main
System
Users
Telephony
Internet Uplink
LAN Services
epygi
TQuadro225
Networking Tools
Ping Target:
192.168.0.26
Ping
Traceroute Target:
sip.epygi.com
Traceroute
Back
Help
Traceroute to sip.epygi.com
traceroute to sip.epygi.com (69.93.123.244), 30 hops max, 40 byte packets
1 router.epygi.loc (192.168.75.5) 2.964 ms 2.753 ms 2.675 ms
2 satellite.epygi.loc (172.25.4.1) 3.524 ms 3.202 ms 3.51 ms
3 172.25.179.2 (172.25.179.2) 556.052 ms 543.704 ms 580.566 ms
4 * * 172.25.178.1 (172.25.178.1) 936.706 ms
5 gate.epygi.de (10.20.0.1) 963.578 ms 817.532 ms 607.835 ms
6 c025e.ser1-0.elena.kar1.toplink-plan.net (212.126.192.37) 2063.25 ms 3358.26 ms 903.521 ms
7 1e11c.bbo4.franca.fra3.toplink-plan.net (213.218.30.17) 911.112 ms 869.278 ms 904.018 ms
8 ffm-s2-rou-1071.de.eurorings.net (134.222.105.177) 2703.38 ms * 875.451 ms
9 de-cix.fra.above.net (80.81.192.226) 844.4 ms 923.94 ms 583.735 ms
10 so-0-0-0.cr2.fra1.de.mfnx.net (208.184.102.142) 2287.62 ms 825.968 ms 823.825 ms
11 pos11-0.mpr2.lhr1.uk.above.net (64.125.29.149) 759.737 ms 1283.97 ms 1119.46 ms
Copyright (C) 2004 Epygi Technologies, Ltd. All rights reserved.

Fig. II-37: Networking Tools page

**To Check the Internet connection**

1. Specify destination address for the ICMP request in the **Ping Target** text field.
2. Press the **Ping** button to process the ICMP request.
3. Specify the destination address to trace the route.
4. Press the **Traceroute** button to process the router triggering.

## Diagnostics

The **System Diagnostic** page gives a possibility to run Network and WAN protocol diagnostics, to verify Quadro's connectivity and to download all system logs for possible problems recovery.

The **Start Detecting WAN Protocol** button is used to initiate WAN diagnostics that will detect the WAN IP configuration: static or through DHCP and PPP servers. For static WAN IP configuration, gateway availability is checked. When acting as a client, DHCP and PPP servers' accessibilities are being verified.

The **Start Network Diagnostics** button is used to initiate network diagnostics, i.e., to check the WAN link and IP configuration, to verify gateway, DNS primary and secondary (if configured) servers' accessibilities.

The **Start E1/T1 Diagnostics** button is used to initiate E1/T1 **Link Diagnostic** and **Diagnostic Loopback**. With these tests E1/T1 physical link is checked, Frame Synchronization and Red Alarm states are verified. For successful **Link Diagnostic**, remote side should have Line_loopback or Payload_loopback settings configured or a loopback terminator should be plugged to the Quadro's E1/T1 port. **Diagnostic Loopback** will be initiated if **Link Diagnostic** is failed or E1/T1 link is down.

The field below will display the diagnostics results and the connectivity conditions. The system should be reconfigured if problems occur during the diagnostics.

The **Download system logs** button is used to download all logs to the local PC as a *.tar archive file. These logs can then be used by the Epygi Technical Support Office to determine the problem that had occurred on your Quadro.

The **Reboot this Device** button is used to reboot the Quadro. Please note that the session with the Quadro will be closed, i.e., the Quadro GUI should be newly opened and a new login will be required afterward.

Fig. II-38: System Diagnostic page

## Automatic Provisioning

**Automatic Provisioning** gives a possibility to automatically configure the WAN network settings of Quadro. This is very useful, when the administrator is not actually aware about the Quadro's network settings. **Automatic Provisioning** automatically detects the matching network configuration settings and by applying them on the Quadro, it connects the device to the internet through the available ISP connection.

**Please Note:** **Automatic Provisioning** can be run only from the LAN side of the Quadro, i.e. from the PC connected to the Quadro's LAN.

**Automatic Provisioning** automatically detects and configures the following settings on the Quadro:

- WAN interface type (PPPoE or Ethernet)
- WAN IP settings
- PPP settings
- ISP settings
- DHCP settings
- DNS settings
- NAT Traversal settings

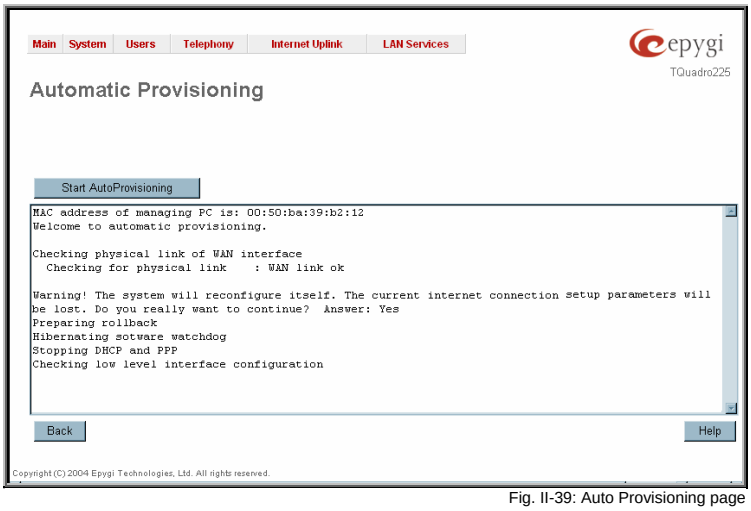

Main
System
Users
Telephony
Internet Uplink
LAN Services
epygi
TQuadro225
Automatic Provisioning
Start AutoProvisioning
MAC address of managing PC is: 00:50:ba:39:b2:12
Welcome to automatic provisioning.
Checking physical link of WAN interface
Checking for physical link : WAN link ok
Warning! The system will reconfigure itself. The current internet connection setup parameters will be lost. Do you really want to continue? Answer: Yes
Preparing rollback
Hibernating sotware watchdog
Stopping DHCP and PPP
Checking low level interface configuration
Back
Help
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Fig. II-39: Auto Provisioning page

## Features

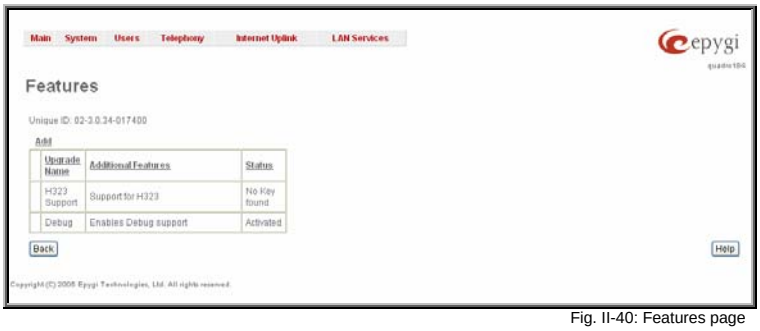


Fig. II-40: Features page

This page lists all features, that may be activated by a software key, characterized by a **Feature Description** and provided with its **Status:**

- **No Key Found** - the feature is currently not available
- **Reboot Needed** - the feature key has been entered and Quadro has to be rebooted
- **Activated** - the feature is available

Following features may be activated via the software key:

- **Debug** – enabled Telnet connection towards the Quadro for debugging purposes.
- **H.323 Support** - enables H.323 IP protocol support on the QuadroGW.

A page with the text field **Feature Key** is opened. Enter the key and press **Save**. The status of the selected feature entry will change to **Reboot needed**. Reboot the Quadro and the feature will get the status **Activated.**

To get a **Feature Key** register the Quadro device and send a corresponding request to Epygi's Technical Support. This request must include the **Unique ID** that is displayed in the **Features** page above the features list.

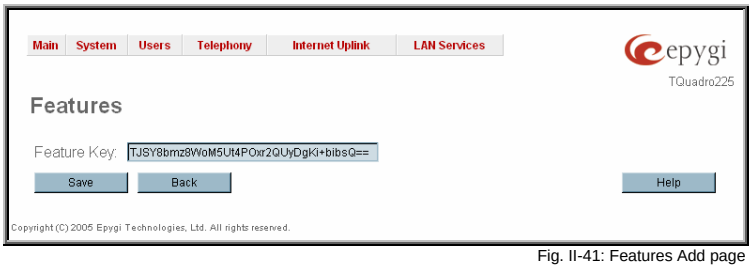


Fig. II-41: Features Add page

## Upload Language Pack

**Upload Language Pack** page allows to upload a custom language for GUI and Voice Messages of the Quadro. The language of voice messages can be switched to the custom Language Pack language from GUI setting page at the System Configuration Wizard. The language of GUI session can be changed to the custom Language Pack language from the radio buttons on the login page.

Uploading a Language Pack will cause the loss of the following data:

- All internally stored voice mail
- DHCP leases
- Call statistics
- Pending events
- Transfer statistics

**Please Note:** Only one custom Language Pack can be uploaded at the time. Uploading a Language Pack will remove the existing one (if existing) and will reboot the Quadro.

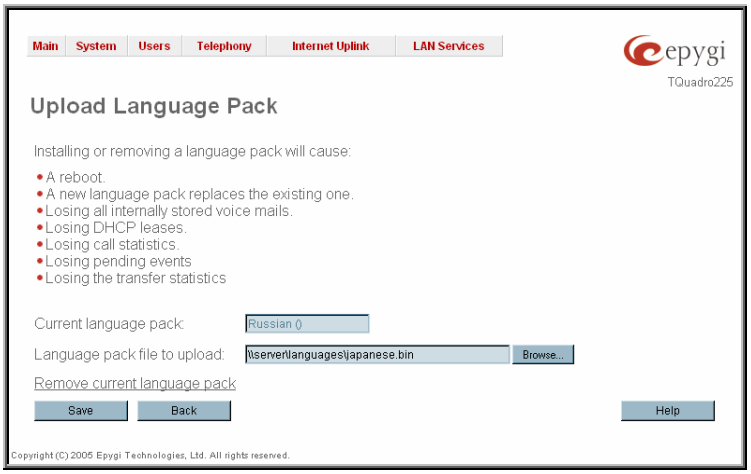


Fig. II-42: Upload Language Pack page

**Current Language Pack** field displays a read only information about the custom language pack uploaded. When no custom language pack is uploaded, field indicates “unknown”.

Below, there is a **Language Pack File to Upload** text field which displays the selected image filename. **Browse** button is used to browse the custom language pack to be uploaded.

**Remove Current Language Pack** link is seen only when custom language pack is uploaded and is used to remove it from the system.

Pressing **Save** will start uploading the custom language pack to the board. The next page will be displayed, showing the result of a verification of the language pack being uploaded and asks for confirmation to overwrite the existing custom language pack (if any).

After final confirmation, system will upload the selected custom Language Pack and will reboot.

## Users Menu

Fig. II-43: Telephone Users Menu in Dynamo Theme

F Fig. II-44: Telephone Users Menu in Plain Theme

## User Management

The **User Management** is used to create user extensions and auto attendants on the Quadro. From this page, by clicking on the user extension, administrator can get the extension settings pages.

Two types of user extensions can be created on the Quadro: **active** and **inactive** extensions. Active extensions are those that are attached to a line, can place and receive calls and use available telephony services. Inactive extensions are those that are not attached to the line, they can use some available telephony services but cannot place and receive calls.

QuadroE1/T1 has one available line and only one active extension can be configured.

Attendant extensions are dedicated to the IVR system on the Quadro, which is used by the callers to reach Quadro's users, use remote access and call relay services. It is possible to create Auto Attendants with the custom scenarios. By default, Quadro has one Auto Attendant extension (00) which is undeletable.

The **Extensions** table is a list of all extensions and their parameters.

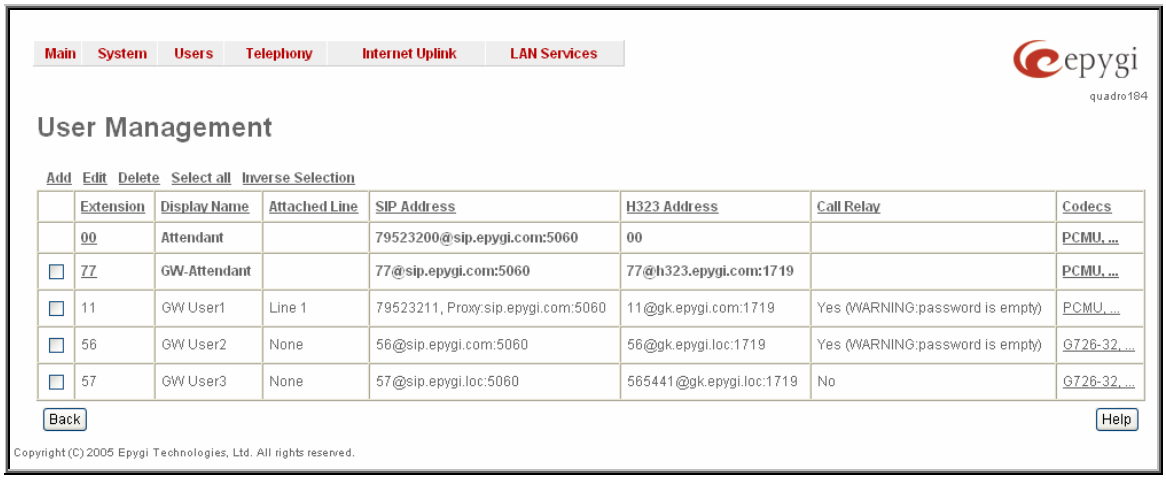


Fig. II-45: Users Management page

The following columns are present in the table:

- **Extension** - lists the 2-digit user or attendant extensions on the Quadro. This number is used for internal PBX calls.
- **Display Name** - indicates an optional display name to identify the caller.
- **Attached Line** - indicates the FXS or IP line corresponding extension is attached to. "R" is displayed in this column when **SIP Remote Extension** (see below) functionality is enabled on the extension.
- **SIP Address** - displays the SIP address of the corresponding extension. Column displays the full SIP address, (i.e., username@sipserver:port) when the **Registration on SIP Server** checkbox is selected. Else, if registration is disabled, the SIP address will be displayed in the following format: "username, Proxy: sipserver:port". If no SIP registration server or SIP server port is defined, corresponding information will be skipped in this column. If no username is defined, the extension number will be displayed instead.
- **H323 Address** - displays the H.323 address of the corresponding extension. Column displays the full H.323 address, (i.e., username@h323gatekeeper:port) when the **Registration on Gatekeeper** checkbox is selected. Else, if registration is disabled, the Gatekeeper address will be displayed in the following format: "username, Proxy: h323gatekeeper:port". If no Gatekeeper Registration Address or Gatekeeper Registration Port is defined, corresponding information will be skipped in this column. If no username is defined, the extension number will be displayed instead.
- **Call Relay** - indicates whether or not Call Relay option is enabled on the extension.
- **Codecs** – column lists the short information (full information is seen in the tool tip) about extension specific voice Codecs. Extension codec's can be accessed and modified by clicking on the link of the corresponding extension's Codecs. The link leads to the Extension Codecs page.

**Add** opens the **Add Entry** page where the type and the number of new extension should be defined. Page consists of the following components:

**Extension** text field is used to enter a new extension number. The extension number is a two-digit number. If non-digit symbols have been entered, the error "Incorrect Extension: no symbol characters allowed" occurs. If the extension length is shorter than 2 digits, the error "Incorrect Extensions length" will prevent the creation of the extension. If an extension with the same number already exists in the User Management table, the error "Extension already exists" will appear.

**Please Note:** Extension number cannot start with digits 0, 8 or 9.

**Type** drop down list is used to select the type of the extension (user or attendant) to be created.

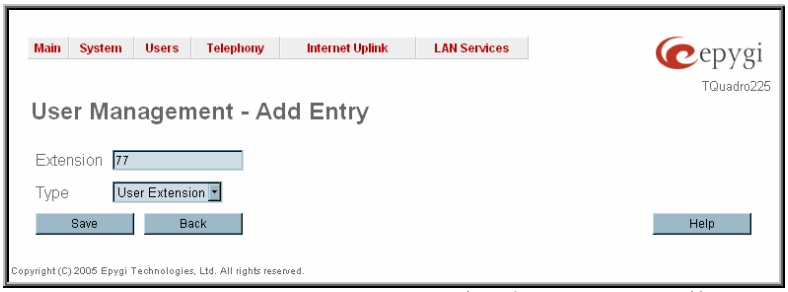


Fig. II-46: User Management - Add Entry page

**Edit** opens the **Edit Entry** page where a newly created user or attendant extension settings might be adjusted. To operate with **Edit**, one or more record(s) have to be selected, otherwise an error will occur: "No records selected".

The **Edit Entry** page for user extensions is divided into following areas and requires the data necessary to configure a user extension.

**1. Extension Settings**
This group requires personal extension information and has the following components:

**Extension** field indicates non editable information about extension number.

**Display Name** is an optional parameter used to recognize the caller. Usually the display name appears on the called party's phone display whenever a call is performed or a voice mail is sent. The field is not limited regarding symbol usage and length.

**Password** requires a password for the new extension.

The extension password may only contain digits. If non-numeric symbols are entered an "Incorrect Password: no symbol characters allowed" error will prevent making the extension.

**Confirm Password** requires a password confirmation. If the input is not corresponding to the one in the **Extension Password** field, the error will appear: "Incorrect Password confirm".

**Attached Line** lists all free lines to where an extension may be attached.

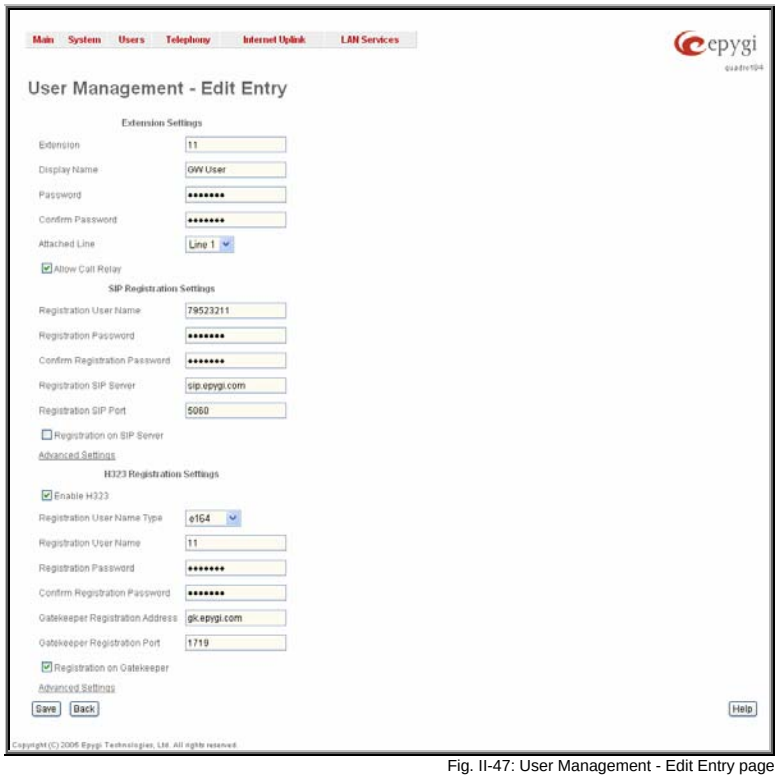


Fig. II-47: User Management - Edit Entry page

**Allow Call Relay** enables the current extension to be used to access the Call Relay service in the Quadro's Auto Attendant. It is recommended to define a proper and non-empty password when enabling this feature in order to protect the Call Relay service from an unauthenticated access.

**SIP Registration Settings**

This group requires the SIP registration settings for the extension and requires the following fields to be filled in:

**Registration User Name** requires a user name for the extension registration on the SIP server. The registration user name needs to be unique on the SIP server and is being displayed on the called phone whenever performing an IP call.

**Registration Password** indicates the password for the extension registration on a SIP server.

**Confirm Registration Password** is used to confirm the password. If the entered password does not correspond to the one given in the **Registration Password** field, the error will appear: "The passwords do not match. Please try again".

**Registration SIP Server** indicates the host address of the SIP server. The field is not limited regarding symbol usage and length as it can be either an IP address, e.g., 192.168.0.26 or a host address, e.g., sip.epygi.com.

**Registration SIP Port** indicates the host port number to connect to the SIP server. The SIP server port may only contain digit values, otherwise the error message "SIP Server Port is incorrect" will be displayed when applying the extension settings. If the SIP server port is not specified, Quadro will access the SIP server through the default port 5060.

**Registration on SIP Server** enables the SIP server registration option. If the extension has already been registered at some SIP server, its IP address will be displayed in brackets.

The **Advanced Settings** link appears only in the **Edit Entry** page and leads to the SIP Advanced Settings page, where the **Outbound Proxy**, **Secondary SIP Server** and **Outbound Proxy for the Secondary SIP Server** and other settings can be configured.

**H323 Registration Settings**

**Enable H323** checkbox enables H323 protocol support on the extension. If this feature is enabled, corresponding extension is free to accept and place H323 IP calls.

**Registration User Name Type** drop down list is used to choose the type of the H323 registration user name: e164, H323ID, URL or Email.

**Registration User Name** requires a user name for the extension registration on the H323 gatekeeper. Depending on the **H323 Registration User Name Type** selected in the list above, **Registration User Name** inserted in this field may contain different characters: for **e164** user name type digit characters allowed only, **H323ID** user name type allows any characters for the registration user name, **URL** registration user name requires IP address or the hostname, while **Email** registration user name requires an email address. The registration user name needs to be unique on the H323 gatekeeper and is being displayed on the called phone whenever performing an IP call.

**Registration Password** indicates the password for the extension registration on a H323 gatekeeper.

**Confirm Registration Password** is used to confirm the password. If the entered Password does not correspond to the one given in the **Registration Password** field, the error will appear: "The passwords do not match. Please try again".

**Gatekeeper Registration Address** indicates the host address of the H323 gatekeeper. The field is not limited regarding symbol usage and length as it can be either an IP address (ex: 192.168.0.26) or a host address (ex: h323.epygi.com).

**Gatekeeper Registration Port** indicates the host port number to connect to the H323 gatekeeper. The H323 gatekeeper port may only contain digit values, otherwise the error message "H323 gatekeeper Port is incorrect" will be displayed when applying the extension settings. If the Gatekeeper Registration Port is not specified, Quadro will access the H323 gatekeeper through the default port 1719.

**Registration on Gatekeeper** enables the H323 gatekeeper registration option. If the extension has already been registered at some H323 gatekeeper its IP address will be displayed in brackets.

The **Advanced Settings** link appears only in the **Edit Entry** page and leads to the H323 Advanced Settings page, where the **User ID** and **H323 Gateway Settings** can be configured.

The **Edit Entry** page for attendant extensions is divided into following areas and requires the data necessary to configure a attendant extension. Additionally this page can be accessed by clicking on the default **00** attendant extension.

The page with the **Auto Attendant settings** is divided into following areas and requires the information necessary to configure the Auto Attendant:

**1. Attendant Settings**

This group displays the non editable **Attendant** number for the Auto Attendant and allows defining the Auto Attendant extension **Display Name**.

**2. SIP Registration Settings**

This group requires the Auto Attendant SIP registration settings and has the following components:

The **Registration User Name** text field defines the user name for the registration at a SIP Server.

The **Registration Password** text field indicates a password for the Auto Attendant extension registration at a SIP server.

The **Confirm Registration Password** text field is used to confirm the password. If the entered password does not correspond to the one given in the **Registration Password** field, the error will appear: "The passwords do not match. Please try again".

The **Registration SIP Server** text field indicates the host address of the SIP Server. The field is not limited regarding symbol usage and length as it can be either an IP number, e.g., 192.168.0.26 or a host address, e.g., sip.epygi.com.

The **Registration SIP Port** text field indicates the Host Port number to connect to the SIP server. It only may consist of numerics, otherwise the error message "SIP Server Port is incorrect" will be displayed when attempting to save the SIP Registration Settings. If no SIP server port is specified, Quadro will access the SIP server through its default port 5060.

The **Registration on SIP Server** checkbox enables the SIP server registration option for the Auto Attendant.

The **Advanced Settings** link leads to the SIP Advanced Settings page where the **Outbound Proxy**, **Secondary SIP Server** and **Outbound Proxy for the Secondary SIP Server** and other settings can be configured.

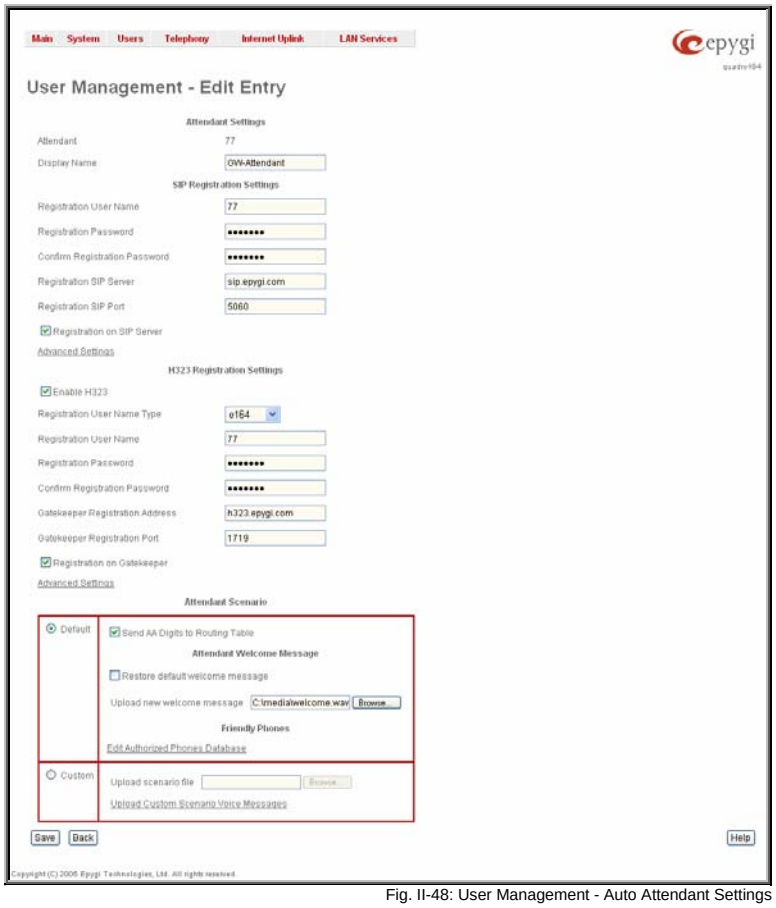

Fig. II-48: User Management - Auto Attendant Settings

**3. H323 Registration Settings**

**Enable H323** checkbox enables H323 protocol support on the extension. If this feature is enabled, corresponding extension is free to accept and place H323 IP calls.

**Registration User Name Type** drop down list is used to choose the type of the H323 registration user name: e164, H323ID, URL or Email.

**Registration User Name** requires a user name for the extension registration on the H323 gatekeeper. Depending on the **H323 Registration User Name Type** selected in the list above, **Registration User Name** inserted in this field may contain different characters: for **e164** user name type digit characters allowed only, **H323ID** user name type allows any characters for the registration user name, **URL** registration user name requires IP address or the hostname, while **Email** registration user name requires an email address. The registration user name needs to be unique on the H323 gatekeeper and is being displayed on the called phone whenever performing an IP call.

**Registration Password** indicates the password for the extension registration on a H323 gatekeeper.

**Confirm Registration Password** is used to confirm the password. If the entered Password does not correspond to the one given in the **Registration Password** field, the error will appear: "The passwords do not match. Please try again".

**Gatekeeper Registration Address** indicates the host address of the H323 gatekeeper. The field is not limited regarding symbol usage and length as it can be either an IP address (ex: 192.168.0.26) or a host address (ex: h323.epygi.com).

**Gatekeeper Registration Port** indicates the host port number to connect to the H323 gatekeeper. The H323 gatekeeper port may only contain digit values, otherwise the error message "H323 gatekeeper Port is incorrect" will be displayed when applying the extension settings. If the Gatekeeper Registration Port is not specified, Quadro will access the H323 gatekeeper through the default port 1719.

**Registration on Gatekeeper** enables the H323 gatekeeper registration option. If the extension has already been registered at some H323 gatekeeper its IP address will be displayed in brackets.

The **Advanced Settings** link appears only in the **Edit Entry** page and leads to the

H323 Advanced Settings page, where the **User ID** and **H323 Gateway Settings** can be configured.

**4. Attendant Scenario**

This group allows to select between default and custom attendant functionality scenarios. When **Default** scenario is selected, a group of settings should be adjusted, user defined Auto Attendant welcome messages can be uploaded and the list of **Friendly Phones** can be configured. For **Custom** scenario, scenario script file (in EpygiXML coding, the coding standard can be found at Epygi Technical Support) should be defined and custom voice messages can be uploaded.

**Default** manipulation radio button selection enables following components:

- **Send AA Digits to Routing Table** checkbox selection switches the Auto Attendant to the routing mode. Any inserted digits in the Connection menu will be parsed through the Routing Table on the Quadro.

  **Please Note:** This checkbox affects ONLY Connections Menu (see Auto Attendant Services). In Call Relay Menu, the routing prefix needs to be dialed (see Feature Codes) to parse the dialed number through the Routing Table.

- **Attendant Welcome Message -** this group allows updating the active Auto Attendant welcome message, downloading it to the PC, or restoring the default one. The group offers the following components:

  The **Restore Default Welcome Message** checkbox allows restoring the Auto Attendant default welcome message file if another one has been previously selected. If the checkbox is selected, the file upload will be disabled.

  **Upload new welcome message** indicates the file name used to upload a new welcome message. The uploaded file needs to be in PCMU wave format, otherwise the system will prevent uploading it with the "Invalid audio file, or format is not supported" warning message. The system also prevents uploading if there is not enough memory available for the corresponding extension, which will cause the "You do not have enough space" warning.

  **Browse** opens the file chooser window to browse for a new welcome message file.

  The **Download Welcome Message File** link appears only if a file has been previously uploaded. The link is used to download the audio file to the PC and opens the file chooser window where the saving location can be specified.

- **Routing Attendant Welcome Message -** this group is available for default 00 attendant only and allows updating a welcome message played when Auto Attendant acts in the routing mode (i.e., incoming calls to FXO line or ISDN timeslot are routed to the Routing agent), downloading it to the PC, or restoring the default one. The group offers the following components:

  The **Restore Default Routing Welcome Message** checkbox allows restoring the routing Attendant welcome message file if another one has been previously selected. If the checkbox is selected, the file upload will be disabled.

  **Upload new Routing welcome message** indicates the file name used to upload a new welcome message. The uploaded file needs to be in PCMU wave format, otherwise the system will prevent uploading it with the "Invalid audio file, or format is not supported" warning message. The system prevents uploading also if there is not enough memory available for the corresponding extension. This will cause the "You do not have enough space" warning.

  **Browse** opens the file chooser window to browse for a new routing welcome message file.

  The **Download Routing Welcome Message File** link appears only if a routing welcome message has been previously uploaded. The link is used to download the audio file to the PC and opens the file chooser window where the saving location can be specified.

- **Friendly Phones -** the **Edit Authorized Phones Database** link refers to the **Authorized Phones Database** page where trusted external phones are listed. If they are part of the Quadro Authorized Phones database, external SIP or PSTN users are free to access the Quadro Auto Attendant services without passing the authentication. When adding a friendly phone to the list, an existing extension has to be chosen whose parameters (extension number and password, as well as SIP/H.323 and Speed Calling Settings) will be used automatically for the trusted caller access of the Quadro Auto Attendant. A direct connection to the **Call Relay** menu can be provided optionally.

The **Authorized Phones Database** page displays the **Authorized Phones Database** table where the trusted phones are listed. Only SIP and PSTN users can be added to the **Authorized Phones Database**.

The **Authorized Phones Database** table displays all trusted callers with their settings, e.g., call type, caller address, extension they automatically login with, information if they have automatic access to Auto Attendant (Call Relay Menu, etc.).

Fig. II-49: Authorized Phones Database

Each record in the table has an assigned checkbox. The checkbox is used to edit or delete the corresponding record. The "No records selected" error occurs if the user activates the edit or delete button having no records selected. The error "One record should be selected" appears if the user tries to edit more than one record. Each column heading in the table a link. By clicking on the column heading, the table will be sorted by the selected column. Upon sorting (ascending or descending), arrows will be displayed close to the column heading.

The **Add** functional button refers to the **Authorized Phones Database- Add Entry** page where new trusted users may be entered.

The **Authorized Phones Database- Add Entry** page offers two group of input options:

**Caller Settings**

The **Call Type** drop down list includes possible incoming call types (PSTN or SIP). In **SIP**, the caller connects Quadro through a SIP server and **PSTN** means the caller is a PSTN user.

The **Caller Address** text field requires the caller's SIP address (see chapter Entering a SIP Addresses correctly) or PSTN number to be added to the trusted phones' list. The PSTN number length depends on the area code and phone number. The wildcard is supported in this field. If the caller address already exists in the **Authorized Phones Database**, the error "The record already exists" appears when selecting the **Save** button.

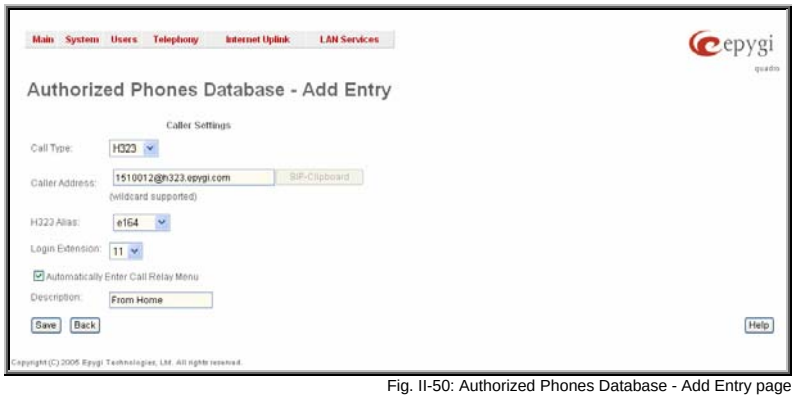


Fig. II-50: Authorized Phones Database - Add Entry page

**H323 Alias** field is actual for H323 call type only and may contain different characters: for **e164** user name type digit characters allowed only, **h323-ID** user name type allows any characters for the registration user name.

The **Login Extension** drop down list provides all existing extensions on the Quadro. When calling the Quadro Auto Attendant, a trusted user will automatically login with the selected extension, i.e., extension number and its password will be automatically submitted by the Quadro system. The trusted user will directly access the Quadro Auto Attendant services. The SIP settings of login extension will be used while making IP calls.

The **Automatically Enter Call Relay Menu** checkbox enables direct access for the trusted user to the Quadro Auto Attendant Call Relay menu. If the checkbox is not selected, a trusted caller will be directed to the Auto Attendant's main menu, but still will be able to reach Remote Access (Voice Mailbox of the specified extension) and Call Relay services (see Feature Codes) with no authentication.

The **Description** text field allows to enter an optional comment.

**Custom** manipulation radio button selection allows to upload Attendant's custom scenario file and voice messages:

**Upload Scenario File** indicates the file name used to upload a new scenario file. The uploaded file needs to be in EpygiXML format (the coding standard can be found at Epygi Technical Support) and is restricted to 20KB file size. **Browse** opens the file chooser window to browse for a custom scenario file.

The **View/Download Scenario** link appears only when a custom scenario file has been previously uploaded and is used to view or download the scenario file. **Remove Scenario** link is used to remove a custom scenario file and to turn to default Auto Attendant scenario.

**Upload Custom Voice Messages** link refers to the same named page where voice messages used in the uploaded custom scenario should be managed.

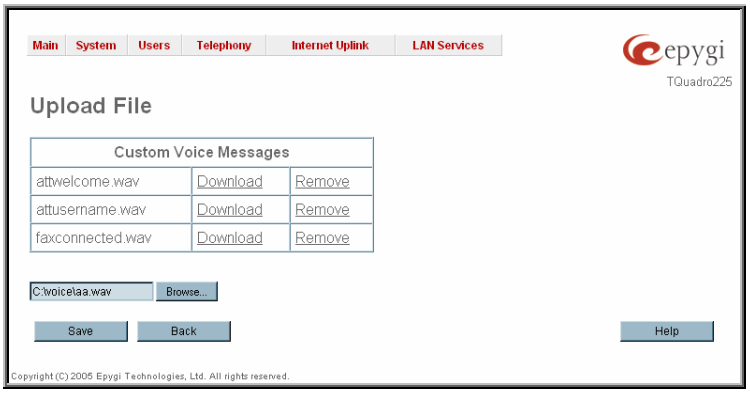


Fig. II-51: Upload Custom Voice Messages page

This page provides a possibility to upload voice messages to be played in the custom Auto Attendant scenario, as well as to remove and to download the uploaded files to PC.

**Upload Custom Voice Messages** page contains a table where uploaded custom voice messages are listed. Use **Download** functional button to download and **Remove** to delete the corresponding custom voice message. **Browse** opens a file chooser window to browse for a custom voice message.

**Custom Hold Music -** this group is available for default 00 attendant only and allows updating default hold music for all those extensions that use the factory default hold music. The group offers the following components:

The **Restore Default Hold Music** checkbox allows restoring the default hold music if another one has been previously selected. If the checkbox is selected, the file upload will be disabled.

**Upload Default Hold Music** indicates the file name used to upload default hold music. The uploaded file needs to be in PCMU wave format, otherwise the system will prevent uploading it with the "Invalid audio file, or format is not supported" warning message. The system prevents uploading also if there is not enough memory available for the corresponding extension. This will cause the "You do not have enough space" warning.

**Browse** opens the file chooser window to browse for a default hold music file.

The **Download Default Hold Music** link appears only if default hold music has been previously uploaded. The link is used to download the audio file to the PC and opens the file chooser window where the saving location can be specified.

Fig. II-52: User Management - Edit Entry page for multiple edit operation

The **Edit** functional button provides a possibility of editing multiple extensions. In this case, fields that cannot be edited for multiple records have **Multiple** values in the **Edit Entry** page. When editing user and attendant extensions together, **Edit Entry** page displayed only those fields that are general for both user extension and attendant settings. Additionally, for the fields that need to be modified, a **Select to modify fields** checkbox alongside the corresponding field needs to be selected to submit changes, otherwise the fields will not be updated.

**Delete** removes the selected extensions. If no records are selected an error message occurs.

**To Configure a User Extension**

1. Press the **Add** button on the **User Management** page. The **Add Entry** page will appear in the browser window.
2. Enter the desired extension number in the **Extension** text field and select "User Extension" in **Type** drop down list.
3. Press **Save** to create a user extension with the defined number.
4. Select the checkbox of the newly created extension in the **User Management** table and press **Edit** button. The **Edit Entry** page will appear in the browser window.
5. Define the extension name in the **Display Name** text field.
6. The extension password has to be entered into the **Password** text field and confirmed in the **Confirm Password** text field.
7. To attach the extension to a line, select a line from the **Attached Line** drop down list. Now the attached extension is ready to receive and perform calls.
8. Enable **Call Relay** option if needed.
9. Configure **SIP Registration Settings** (SIP server, port number, SIP registration user name, and the password) and **Enable Registration on SIP Server**, if needed.
10. Configure **H323 Registration Settings** (Enable H.323, Gatekeeper Registration Address, Gatekeeper Registration Port, Registration user name, and the password) and enable **Registration on Gatekeeper**, if needed.
11. Configure **Advanced SIP Settings** (User ID, Send Keep-alive Messages to Proxy, Outbound Proxy, Secondary SIP Server and Outbound Proxy for Secondary SIP Server).
12. To apply extension settings, press **Save**.

**To Configure an Attendant Extension**

1. Press the **Add** button on the **User Management** page. The **Add Entry** page will appear in the browser window.
2. Enter the desired extension number in the **Extension** text field and select "Attendant" in **Type** drop down list.
3. Press **Save** to create an attendant extension with the defined number.
4. Select the checkbox of the newly created extension in the **User Management** table and press **Edit** button. The **Edit Entry** page will appear in the browser window. To access **Edit Entry** page for default **00** attendant extension, simply click on extension number in User Management table and skip 1-4 steps of this guidance.
5. Define the Attendant **Display Name** in the corresponding text field.
6 Configure **SIP Registration Settings** (SIP server, port number, SIP registration user name, and the password) and **Enable Registration on SIP Server**, if needed.
7. Configure **Advanced SIP Settings** (User ID, Send Keep-alive Messages to Proxy, Outbound Proxy, Secondary SIP Server and Outbound Proxy for Secondary SIP Server).
8. Configure **H323 Registration Settings** (Registration Gatekeeper Address, port number, Registration user name, and the password) and enable **Registration on Gatekeeper**, if needed.
9. Configure **Advanced H323 Settings** (User ID and H323 Gateway Settings).
10. Choose between **Default** or **Custom Attendant Scenario** modes. For **Default Attendant Scenario** mode, **Send AA digits to Routing** table checkbox can be enabled, if needed, as well as Attendant Welcome Message and Attendant Routing Welcome Message can be uploaded, restored or downloaded to PC. Additionally Friendly Phones allowed to connect to Quadro's Auto Attendant can be configured by pressing the **Edit Authorized Phones Database** link. For **Custom Attendant Scenario** mode, Attendant's custom scenario file can be uploaded and a list of custom voice messages can be configured.

**To Delete an Extension**

1. To remove an extension with all its settings select one or more checkboxes of the corresponding extensions that ought to be deleted from the **User Management** table. Press **Select all** if all extensions ought to be deleted.
2. Click on the **Delete** button on the **User Management** page.
3. Confirm the deletion with **Yes**. The extension will be deleted. To abort the deletion and keep the extension in the list, click **No**.

**To Add an Authorized phone to the database**

1. Enter the desired **Auto Attendant Settings** page.
2. Select **Edit Authorized Phones Database** to enter the **Authorized Phones Database** page.
3. Press the **Add** button on the **Authorized Phones Database** page. The **Add Entry** page will appear in the browser window.
4. Choose the call type and enter a caller address in the corresponding text field.
5. Select a **Login Extension** and the **Automatically Enter Call Relay Menu** checkbox (if needed).
6. Enable **Call Back** service if needed and define a **Call Back Destination** in the same named field.
7. Fill in an optional **Description** in the appropriate field, if needed.
8. Press **Save** to submit the settings.

**To Delete an Authorized phone from the database**

1. Enter the desired **Auto Attendant Settings** page.
2. Select **Edit Authorized Phones Database** to enter the **Authorized Phones Database** page.
3. To remove an authorized phone(s), select one or more checkboxes of the corresponding records that ought to be deleted from the **Authorized Phones Database** table. Press **Select all** if all records ought to be deleted.
4. Press the **Delete** button on the **Authorized Phones Database** page.
5. Confirm the deletion with **Yes** or cancel with **No**.

## SIP Advanced Settings

The **SIP Advanced Settings** page is used to configure the Outbound Proxy, Secondary SIP Server and Outbound Proxy for the Secondary SIP Server settings and to define other SIP server specific settings.

SIP Outbound proxy is such a SIP server, where all the SIP requests and other SIP messages are transferred. Some SIP servers use an outbound proxy server to escape restrictions of NAT, e.g., Free World Dialup service uses an Outbound Proxy server. If an Outbound proxy is specified for an extension, all SIP calls originating from that extension are made through that outbound proxy, i.e., all requests are sent to that outbound proxy, even those call by Speed Calling.

The Secondary SIP Server acts as an alternative SIP registration server when the primary SIP Registration Server (defined from the SIP Registration Settings page) is inaccessible. If the connection with the primary SIP server fails, Quadro will automatically start sending SIP messages to the Secondary SIP Server, and will switch back to the primary SIP server, as soon as its connection is reestablished.

The **SIP Advanced Settings** page consists of the following components:

**UserID** requires an identification parameter to reach the SIP server. It should have been provided by the SIP service provider and can be requested for some SIP servers only, for others, the field should be left empty.

**Send Keep-alive Messages to Proxy** enables the SIP registration server accessibility verification mechanism. **Timeout** indicates the timeout between two attempts of SIP registration server accessibility verification. If no reply is received from the primary SIP server within this timeout, the Secondary SIP server will be contacted. When the primary SIP server recovers, SIP packets will be sent to it once again.

A group of **Host address** and **Port** text fields respectively require the host address (IP address or the host name), the port number of the **Outbound Proxy**, **Secondary SIP Server** and the **Outbound Proxy for the Secondary SIP Server**. These settings are provided by the SIP servers' providers and are used by Quadro to reach the selected SIP servers.

**RTP Priority Level** drop down list is used to select the priority (low, medium or high) of RTP packets sent from corresponding extension. RTP packets with higher priority will be preceded first in case of heavy traffic.

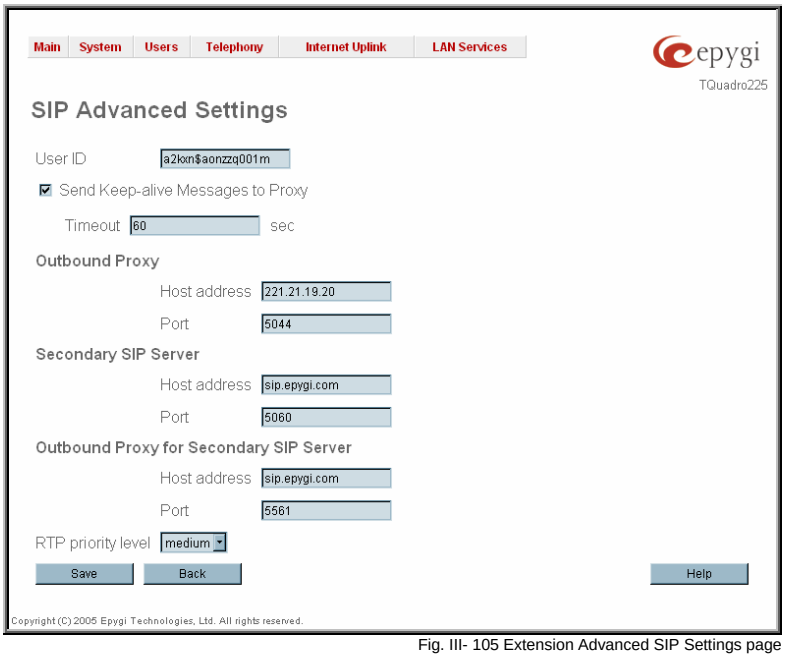


Fig. III- 105 Extension Advanced SIP Settings page

## H323 Advanced Settings

The **H323 Advances Settings** page is used for the H.323 gateway settings configuration to allow Quadro extension to use services provided by the H.323 gateway. Depending on the H.323 gateway configuration, it can provide call routing services to the different type of networks (e.g. PSTN).

The **UserID** (Alias Name) text field requires an identification parameter to reach the H323 Gatekeeper. It should be provided by the H323 service provider and can be requested for some H323 Gatekeepers only, for others field should be left empty.

The **Address** text field requires the IP address or the host name of the H.323 gateway. The **Port** text field requires the port number of the H323 gateway.

The **Dial Access Plan** text field requires a service identification number H323 gateway provides to the extension. This option is independent from the **Address** and **Port** parameters, i.e. can be also configured when other two fields are empty.

**Address**, **Port** and the **Dial Access Plan** are provided by the H.323 service provider and are used by Quadro to set the H.323 gateway specific features.

**Please Note:** **Address** and **Port** settings specified here will be only used when extension is not registered on the H.323 gatekeeper (and will be ignored in the contrary case), also when originating the H.323 IP call using shared H.323 registration settings of this extension.

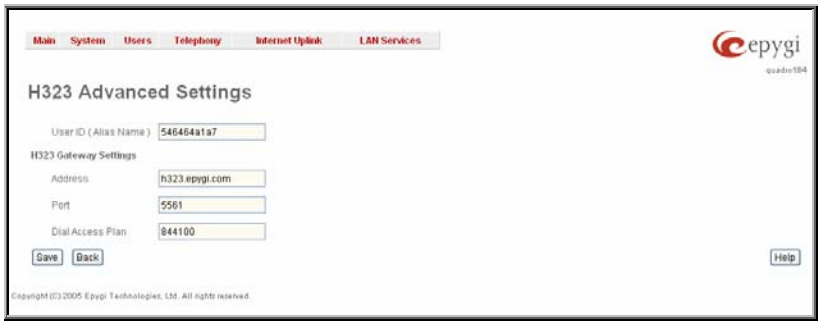


Fig. III- 205 Extension Advanced H.323 Settings page

## Extension Codecs

To establish IP voice communication, both partners have to use the same codec. During establishing the communication line, this codec is negotiated. If the caller does not find a fitting codec, the communication cannot take place. So, if you want to be reachable by preferably all IP calls, it is helpful to support as many codecs as possible. In this case, all the codecs that Quadro offers should be added to the **Active Codecs** table. On the other hand, some codecs require a high transfer rate - up to 64 kbit/s. If you are certain you do not want to use these codecs, you have to make sure they are not listed in the table **Active Codecs**.

The **Extension Codecs** page displays a list of **Active Codecs** and the state of the **Out of Band DTMF** and **FAX Support** features for Quadro extensions (also Auto Attendant).

**Please Note:** Use caution when configuring Auto Attendant Codecs as they are used by virtual extensions for redirecting the incoming calls.

The table **Active Codecs** lists active voice codecs for the selected line that are supported by Quadro. The order of records in the **Active Codecs** table is important for transmitting and receiving. A codec placed at the top of the table will be used as the preferred codec. If the remote party does not support the preferred codec, the following codecs will be tried out in a top-down order in the **Active Codecs** table.

Each record in the table has an assigned checkbox. It is used to select the record to be deleted or moved up or down.

An error occurs if no records are selected and the user activates the delete button: “No records selected”. At least one codec must be attached to the line. When attempting to delete the last codec, this error will occur: “At least one codec should stay in the codec list”.

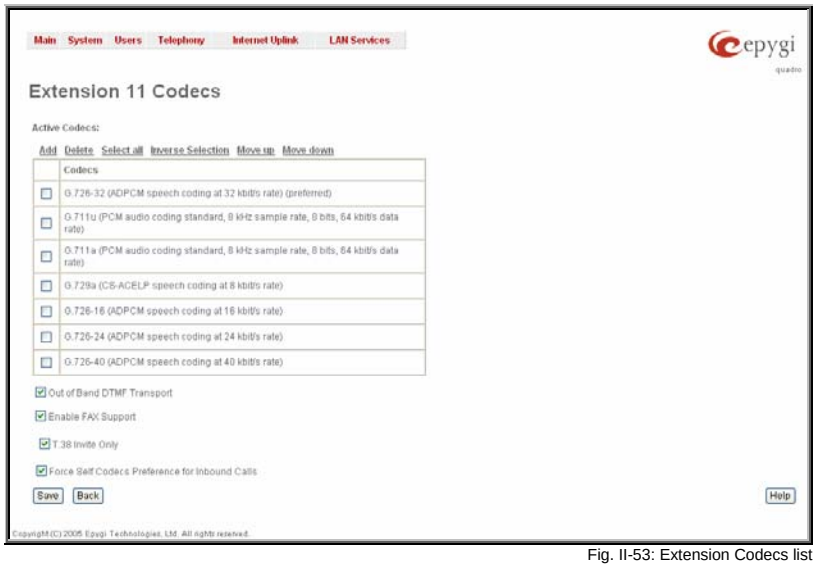
Main System Users Telephony Internet Uplink LAN Services
epygi
Extension 11 Codecs
Active Codecs:
Add Delete Select all Inverse Selection Move up Move down
Codecs
G.726-32 (ADPCM speech coding at 32 kbit/s rate) (preferred)
G.711u (PCM audio coding standard, 8 kHz sample rate, 8 bits, 64 kbit/s data rate)
G.711a (PCM audio coding standard, 8 kHz sample rate, 8 bits, 64 kbit/s data rate)
G.729a (CS-ACELP speech coding at 8 kbit/s rate)
G.726-16 (ADPCM speech coding at 16 kbit/s rate)
G.726-24 (ADPCM speech coding at 24 kbit/s rate)
G.726-40 (ADPCM speech coding at 40 kbit/s rate)
Out of Band DTMF Transport
Enable FAX Support
T.38 Invite Only
Force Self Codecs Preference for Inbound Calls
Save Back
Help

Fig. II-53: Extension Codecs list

**Add** opens the **Add Entry** page where the user may add codecs supported by Quadro. The voice codec defines the voice compression algorithm for the incoming and outgoing DSP packages.

**Codecs** lists all codecs supported by Quadro. If no more codecs are available (all available codecs have already been transferred to the **Active Codecs** table), the **Add Entry** page will display the message “No Available Codecs” instead of the drop down menu.

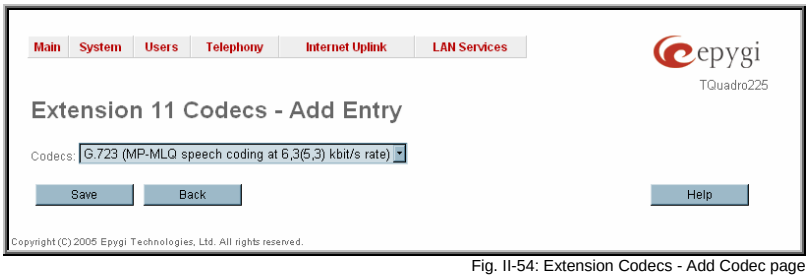
Main System Users Telephony Internet Uplink LAN Services
epygi
TQuadro225
Extension 11 Codecs - Add Entry
Codecs: G.723 (MP-MLQ speech coding at 6,3(5,3) kbit/s rate)
Save Back
Help
Copyright (C) 2005 Epygi Technologies, Ltd. All rights reserved.

Fig. II-54: Extension Codecs - Add Codec page

The **Move Up/Move Down** buttons are used to move the selected codec one level up/down in the table.

The **Out of Band DTMF Transport** checkbox enables DTMF code transmission in parallel with the voice stream. The destination receiving the DTMF code will play it locally if it supports the feature. This is helpful to avoid DTMF's loss upon bad traffic. This feature is valuable for all codecs but it is especially recommended to enable it in case low bit rate codecs (G729, G723, G726/16, etc.) are selected.

**Enable FAX Support** checkbox enables the FAX tone detection and the T.38 codec support for the FAX transmission from/to the Fax Machine/Fax modem attached to the line.

**T.38 Invite Only** checkbox is available when FAX support is enabled and restricts connection establishment to T.38 codec for the corresponding extension, i.e. only T.38 codec will be used.

**Attention:** Selecting the **T.38 Invite Only** checkbox will deny common outgoing calls on the extension. These checkboxes take effect ONLY on FXS lines.

**Force Self Codecs Preference for Inbound Calls** checkbox enables the usage of the own preferred codecs (if available on both peers) for the IP connection establishment on the extension.

## Change Admin Password

The **Change Admin Password** page provides information about the administrator account name and allows changing the administrator password.

It offers the following components:

**Old Password** requires the current password. An error message prevents from entering a wrong one.

**New Password** requires the new password, which has to be confirmed in **Confirm New Password**.

The password may consist of numerical values only. A corresponding warning appears if any other symbols are inserted.

**Please Note:** When reloading a former configuration, the administrator's password specified here is still valid, as the administrator's password is not saved with the configuration.

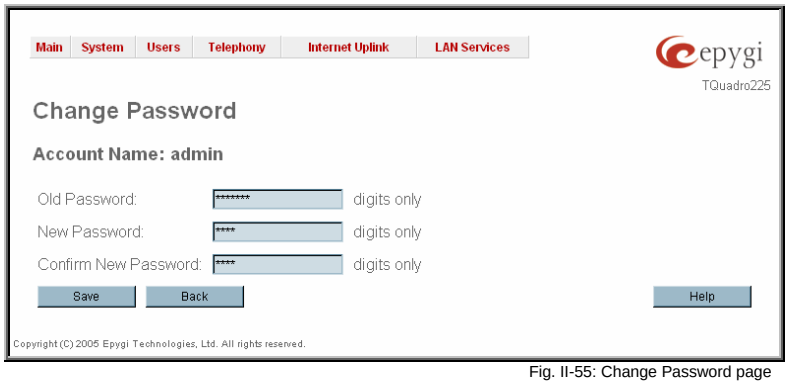


Fig. II-55: Change Password page

## Telephony Menu

Fig. II-56: Telephony Menu in Dynamo Theme

Fig. II-57: Telephony Menu in Plain Theme

## Call Statistics

The **Call Statistics** page displays four tables and provides information on successful, unsuccessful and missed incoming and outgoing calls on the first three tables, and statistics settings on the fourth page. Call statistics allows the collecting of call events on the Quadro with their parameters and to search them by various criteria.

The **Statistics Settings** page offers the following input options:

The **Enable Call Reporting** checkbox enables Call Statistics reporting. The selected number of statistics entries will be displayed in the Call Statistics tables.

The **Maximal Number of Displayed Call Records** drop down lists are used to select the number of **Successful**, **Missed** and **Nonsuccessful** statistics entries to be displayed in the corresponding **Call Statistics** tables. If the record numbers exceed the numbers specified in these drop down lists, the oldest record will be removed.

The **Download Call Statistics** link is used to download all displayed statistics in a file that can be viewed with a simple text editor.

The **Clear all Records** button is used to clear all statistics records.

The **Number of Records** displays the current number of statistics entries in the table. For the successful calls, **Total Duration, Maximum Duration, Average Duration** and **Minimum Duration** statistics are displayed on top of the table.

The **Call Statistics: Successful Calls, Missed Calls and Nonsuccessful Calls** pages consist of the general information on successful, missed and unsuccessful calls, search fields and the calls table. The search components are as follows:

The **From** and **To** text fields are used to search by date and time. The data has to be entered in either of the following formats: dd-mm-yyyy hh:mm:ss or dd-Mon-yyyy hh:mm:ss. The time criteria is optional. **From** requires an earlier date and time than the **To** field. If the entered data does not meet this condition, the error message “Minimal date should be less than maximal date” prevents statistics filtering.

The **From** and **To** drop down lists are used to search by duration. The duration has to be selected from the list values. The **From** field has to indicate a shorter duration than the **To** field. If the inserted data does not meet this condition, the error message “Minimal duration should be less than maximal duration” prevents statistics filtering.

**Calling Phone** and **Called Phone** respectively require the caller and called party’s SIP address (see chapter Entering a SIP Addresses correctly), extension or PSTN number as search

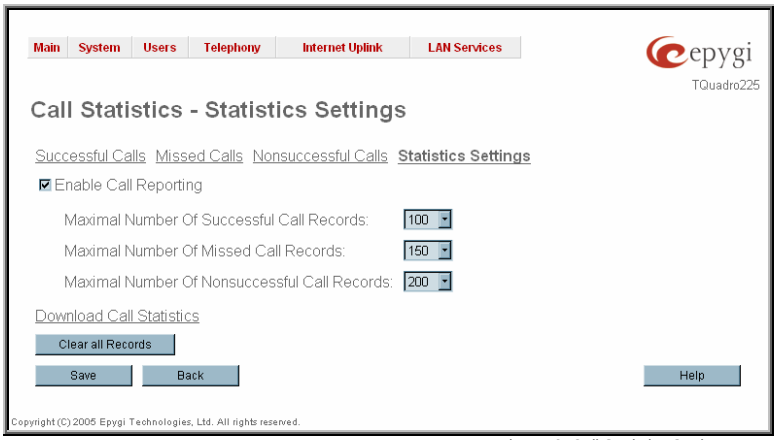
Main System Users Telephony Internet Uplink LAN Services
epygi
TQuadro225
Call Statistics - Statistics Settings
Successful Calls Missed Calls Nonsuccessful Calls Statistics Settings
Enable Call Reporting
Maximal Number Of Successful Call Records: 100
Maximal Number Of Missed Call Records: 150
Maximal Number Of Nonsuccessful Call Records: 200
Download Call Statistics
Clear all Records
Save
Back
Help
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Fig. II-58: Call Statistics Settings page

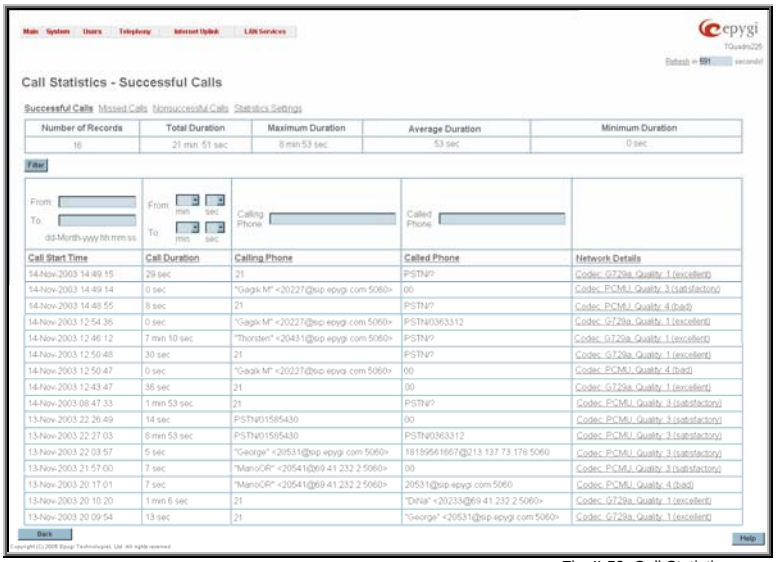


Fig. II-59: Call Statistics page

criteria. Wildcard symbols are allowed here.

The **Call Statistics: Successful Calls, Missed Calls and NonSuccessful Calls** tables are lists of successful, missed and unsuccessful incoming and outgoing calls and their parameters (Call Start Time, Call Duration, Call destinations). Each column heading in the tables is a link. By clicking on the column heading, the table will be sorted by the selected column. Upon sorting (ascending or descending), arrows will be displayed close to the column heading.

**Network Details** column is present in **Successful Calls** table only and provides brief information about the call quality and codecs used for receive and transmit packets. Clicking on the successful call details will open RTP Statistics page where detailed information (Call Quality, Receive and Transmit Codecs, Number of Packets and Packet Sizes, Number of Received Lost Packets, Receive Jitter and Receive Maximum Delay) about the established call is provided. **Call Detail** column is present in **Non Successful Calls** table only and indicates the reason of the call being unsuccessful.

**Filter** performs a search procedure by the selected criteria. The search may be done with several criteria at once.

**To Enable/Disable the Statistics**

1. Enter the **Call Statistics Settings** page.
2. Select/deselect the **Enable Call Reporting** checkbox to enable/disable statistics recording.
3. If enabling the statistics, the maximum number of records to be stored in the statistics table should be selected from the corresponding drop down lists.
4. Press **Save** to apply the new configuration.

**To Filter the Statistics**

1. Enter the desired criteria fields.
2. Press the **Filter** button to search the call reports within the **Call Statistics** table.

**Please Note:** To return to the complete **Statistics Table** clear all search criteria and press **Filter**.

**To Reset the Statistics**

1. Press the **Clear All Records** button in the **Call Statistics Settings** page.
2. Confirm the deletion with **Yes**. The call statistics will be deleted. To abort the deletion and keep the statistics information, click **No**.

## RTP Statistics

The **RTP Statistics** page provides detailed information (Call Quality, Receive and Transmit Codecs, Number of Packets and Packet Sizes, Number of Received Lost Packets, Receive Jitter and Receive Maximum Delay) about the established call is provided.

Below is the legend for Call Quality definitions on the displayed RTP Statistics:

**excellent** - lost packets <= 1% & max_arrival_delay <= 100 ms
**good** - lost packets <= 5% & max_arrival_delay <= 200 ms
**satisfactory** - lost packets <= 10% & max_arrival_delay <= 400 ms
**bad** - lost packets <= 20% & max_arrival_delay <= 600 ms
**very** bad - lost packets > 20% or max_arrival_delay > 600 ms

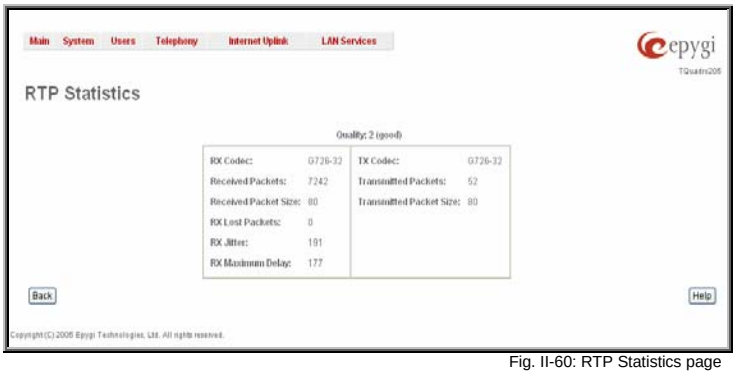


Fig. II-60: RTP Statistics page

## SIP Settings

The **SIP Settings** provide information on the SIP receive UDP and TCP ports and allows to select DNS server configuration for SIP and SIP timers scheme.

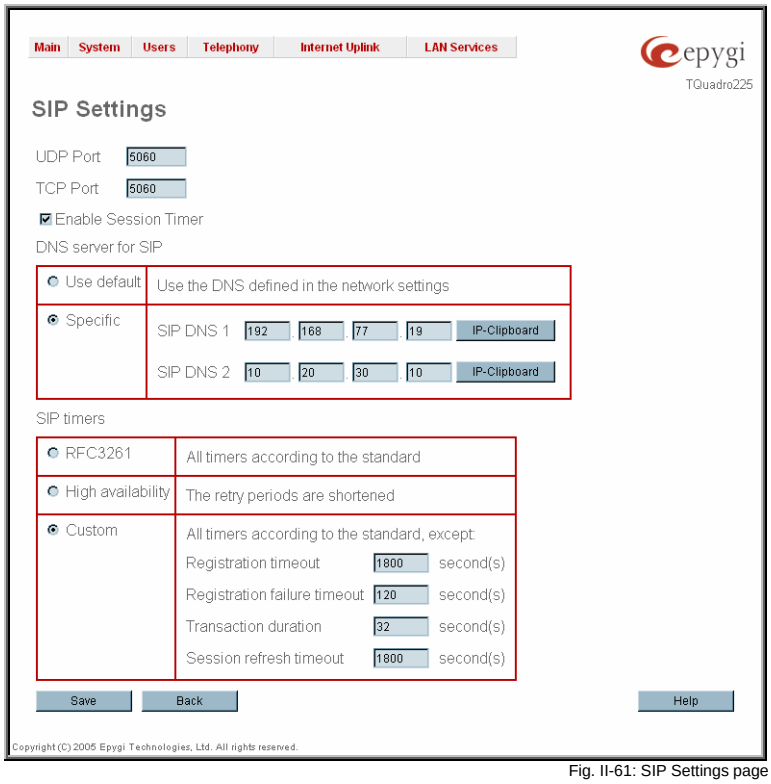

Fig. II-61: SIP Settings page

**UDP Port** indicates the SIP UDP (User Datagram Protocol) receive port number. By default 5060 is selected and used. The SIP UDP port cannot be in the selected RTP/RTCP port range for FXS and IP lines (see RTP Settings), otherwise the "Mapped port for SIP shouldn't be in RTP port range" error appears.

**TCP Port** indicates the SIP TCP (Transmission Control Protocol) receive port number. By default 5060 is selected and used.

**Please Note:** Quadro will not use TCP protocol as a transport for SIP messages if the **TCP Port** field is left empty.

**Enable Session Timer** enables advanced mechanisms for connection activity checking. This option allows both user agents and proxies to determine if the SIP session is still active.

The **DNS server for SIP** radio button group allows to choose between regular DNS servers configured in the DNS Settings page and specific DNS servers for the SIP traffic.

- **Use default** is used to apply regular DNS servers for the SIP traffic.
- **Specific** is used to enable SIP specific DNS servers. For this selection, both primary and secondary SIP DNS servers should be defined in the **SIP DNS 1** and **SIP DNS 2** text fields. At the least, a primary DNS server should be inserted.

The **SIP Timers** radio button group is used to define the timeouts of the SIP messages retransmission.

- **RFC 3261** will apply standard SIP timers described in the corresponding specification.
- **High availability** will apply SIP timers to shorten the call establishment, registration confirmation and registration failure procedures. This selection provides more firmness to the SIP connection but increases the network traffic on the Quadro.
- **Custom** allows defining manually the **Registration Timeout**, **Registration Failure Timeout**, **Transaction Duration** and **Session refresh timeout** SIP timers (in seconds).

## H323 Settings

The **H323 Settings** provide information on the H.225 RAS receive UDP port and H.323 TCP port range, enable H323 specific options as well as allows to enable the NAT traversal for the H.323 traffic.

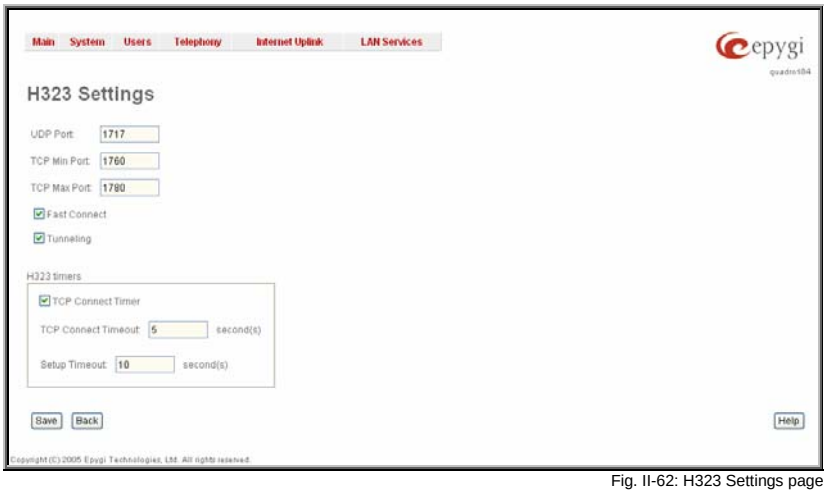


Fig. II-62: H323 Settings page

The text field **UDP Port** indicates the H.225 RAS UDP (User Datagram Protocol) receive port number. UDP port cannot be in the selected RTP/RTCP port range for FXS and IP lines (see RTP Settings) otherwise error appears.

The text fields **TCP Min Port** and **TCP Max Port** text fields are used to indicate the TCP (Transmission Control Protocol) receive port range for H.225 call signaling and H.245 media negotiation. The port defined in the **TCP Min Port** text field will be used for accepting the incoming direct H.323 calls.

There are three ways to set up a H.323 call: a separate H.245 channel, fast connect and tunneling. However, it is not always possible to use fast connect or tunneling and a terminal can at any time switch back to a separate H.245 channel.

**Fast Connect** checkbox enables media negotiation handled by the H.225 call signaling messaging without opening H.245 channel. **Fast Connect** reduces the number of transmitted H.323 messages and allows the media channels to be operational before the connect request is sent and the telephone rings.

**Tunneling** checkbox enables H.245 channel to be sent within the H.225 call signaling channel.

**H323 timers** parameters group allows to specify TCP and Setup timeouts and provides following components:

**TCP Connect Timer** checkbox selection enables custom values of TCP Connect Timer (in seconds). When this checkbox is enabled, **TCP Connect Timeout** text field requires the time of TCP connection establishment. Connection establishment attempts are stopped if no connection has been established within the specified timeout.

**Setup Timeout** text field requires a timeout (in seconds) used on sending first signaling message if there is no any answer from the remote side.

## RTP Settings

The **RTP Settings** page allows the administrator to configure the codec's packet size and silence suppression for each voice codec, to select the G726 codec standard, to define RTP/RTCP port ranges, etc. All parameters listed on this page may be modified and submitted.

The **Codec Properties** table lists all codecs with the corresponding packetization interval and information about silence suppression.

**Edit** opens the **Edit RTP Settings** page where the codec settings can be modified. To use **Edit**, only one codec may be selected at a time, otherwise an error occurs: "One record should be selected".

The **Packetization Interval** is the time interval between two RTP packets of the same stream. If the interval is increased, the overhead is decreased but the voice quality may deteriorate as a result. If the interval is decreased, the network load is increased and the delay is reduced.

**Silence Suppression** disables RTP packet transmission in case of no voice activity. This feature helps to avoid extra traffic if the RTP stream contains no voice. It is activated after two seconds of silence and restarted immediately if any audio appears.

The **G.726 Standard** radio buttons are used to select between packaging the G.726 codewords into octets. If you experience problems with G.726 voice quality having one of these packaging selected, try the other one.

- If **Use ITU_T specification** is selected, the ITU I.366.2 ("AAL2 type 2 service specific convergence sublayer for narrow-band services") type packaging of codewords is used, where packing code words into octets is starting from the most significant rather than the least significant digit in the octet.
- If **Use IETF RFC** is selected, the IETF RFC ("RTP Profile for Audio and Video Conferences with Minimal Control") type packaging of codewords is used, where packing code words is starting from the least significant position in the octet.

Main System Users Telephony Internet Uplink LAN Services
epygi
RTP Settings
Codec Properties:
Edit
Codecs
Packetization Interval
Silence Suppression
G.711u (PCM audio coding standard, 8 kHz sample rate, 8 bits, 64 kbit/s data rate) 20 ms No
G.711a (PCM audio coding standard, 8 kHz sample rate, 8 bits, 64 kbit/s data rate) 20 ms No
G.726-16 (ADPCM speech coding at 16 kbit/s rate) 20 ms Yes
G.726-24 (ADPCM speech coding at 24 kbit/s rate) 20 ms Yes
G.726-32 (ADPCM speech coding at 32 kbit/s rate) 20 ms Yes
G.726-40 (ADPCM speech coding at 40 kbit/s rate) 20 ms Yes
G.729a (CS-ACELP speech coding at 8 kbit/s rate) 20 ms Yes
G.723 (MP-MLQ speech coding at 6,3(5,3) kbit/s rate) 30 ms Yes
iLBC (Internet Low Bit Rate Coder at 13,33 kbit/s rate) 30 ms Yes
G.726 Standard:
Use ITU-T specification
Use IETF RFC
RTP/RTCP Port Range for FXS Lines:
Min 7150
Max 7179
Telephone Event Draft Support
Enable RTCP Support
Save Back
Help

Fig. II-63: RTP Settings page

**RTP/RTCP Port Range for FXS Lines**:

- **Min** - minimal port has to be higher than 1024 and lower than the maximal port range. Only even numbers are allowed.
- **Max** - maximal port has to be lower than 65536 and higher than the minimal port range. Only odd numbers are allowed.

As the specified maximum ports has to be higher than the minimum ports, the error message "Min port number should be less than max port number" will occur if this condition is not met. The port range may consist of digits only, otherwise the error "Incorrect Port Range: only Integer values allowed" occurs. The difference between Max and Min RTP ports should be 50 ports or less (according to the system's capabilities) otherwise the corresponding warning appears. RTP/RTCP Port ranges cannot include the defined SIP UDP ports (see SIP Settings) otherwise an error appears.

**Telephone Event Draft Support** enables telephony events transmission according to the draft-ietf-avt-rfc2833bis-04. The checkbox needs to be toggled if the SIP destination party phone or IVR has problems recognizing DTMFs generated by the Quadro.

**Enable RTCP Support** enables Real Time Control Protocol support and allows for the RTCP packets transmission. RTCP protocol is used for monitoring the RTP streams and changing RTP characteristics depending on Network conditions.

The **RTP Settings – Edit Entry** page offers a drop down list and a checkbox.

**Packetization Interval** contains possible values (in milliseconds) to be configured for the selected codec.

The **Enable Silence Suppression** checkbox selection enables voice activity detection for the selected codec.

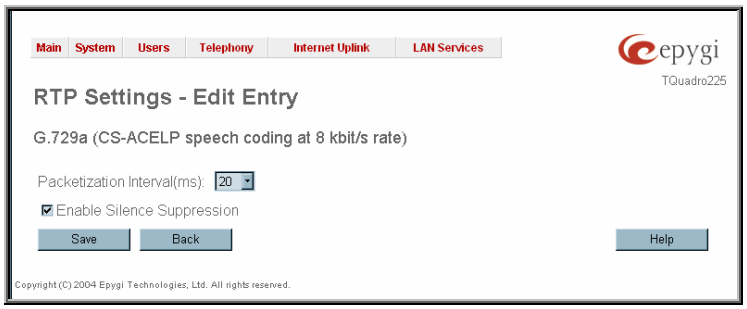


Fig. II-64: RTP Settings - Edit Entry

**To Edit Codec Parameters**

1. Select the codec from the **Codecs Table** that is to be edited.
2. Press the **Edit** button on the **RTP Settings** page. The **Edit Entry** page will appear in the browser window.
3. Change values in **Packetization Interval** and/or enable/disable **Silence Suppression**.
4. To save the codec settings press **Save**, or to keep the initial data click **Back**.

## NAT Traversal Settings

The **NAT Traversal Settings** page is divided into separate pages used to configure SIP and H.323 NAT parameters, RTP and STUN parameters for NAT and a page where the NAT Exclusion table may be filled.

**Use NAT Traversal for SIP** checkbox applies to all pages and is used to enable NAT traversal for the SIP traffic, hence any incoming and outgoing SIP messages from and to the Quadro will be routed through the NAT PC.

**Use NAT Traversal for H323** checkbox applies to all pages and is used to enable NAT traversal for the H.323 traffic, hence any incoming and outgoing SIP messages from and to the Quadro will be routed through the NAT PC.

The **SIP Parameters** page is used to configure NAT specific settings for SIP. and offers two independent group of settings:

**UDP Parameters**:
Manipulation radio buttons allow to select the type of connection over NAT:

Selecting **Use STUN** will switch to automatic discovery of Mapped settings for the SIP UDP traffic over NAT. STUN settings are configured on the STUN parameters page (see below).

Selecting **Use Manual NAT Traversal** allows to define manually the mapped settings for the SIP UDP traffic over NAT:

**Mapped Hos**t requires the IP address of the mapped host for SIP UDP traffic over NAT.

**Mapped Port** requires the port number on the mapped host for the SIP UDP traffic over NAT.

**TCP Parameters:**

**Mapped Hos**t requires the IP address of the mapped host for SIP TCP traffic over NAT.

**Mapped Port** requires the port number on the mapped host for the SIP TCP traffic over NAT.

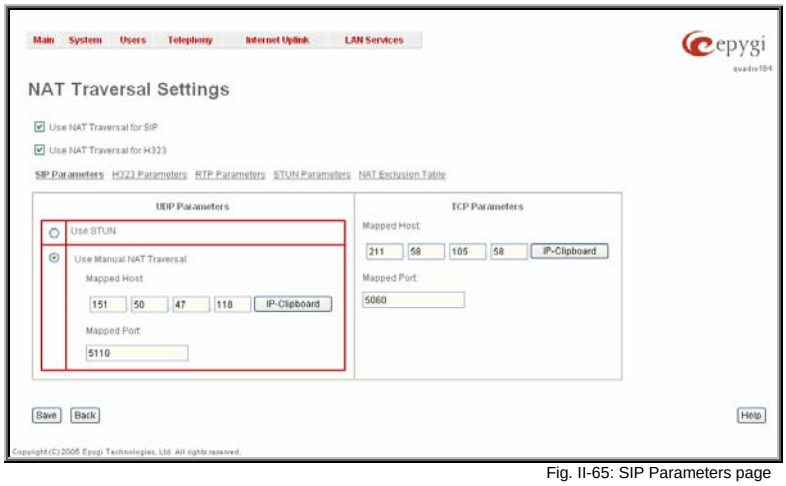


Fig. II-65: SIP Parameters page

The **H323 Parameters** page is used to configure NAT specific settings for H.323. and offers two independent group of settings:

**UDP Parameters**:
Manipulation radio buttons allow to select the type of connection over NAT:

Selecting **Use STUN** will switch to automatic discovery of Mapped settings for the H.323 UDP traffic over NAT. STUN settings are configured on the STUN parameters page (see below).

Selecting **Use Manual NAT Traversal** allows to define manually the mapped settings for the H.323 UDP traffic over NAT:

**Mapped Hos**t requires the IP address of the mapped host for H.323 UDP traffic over NAT.

**Mapped Port** requires the port number on the mapped host for the H.323 UDP traffic over NAT.

**TCP Parameters:**

**Mapped Hos**t requires the IP address of the mapped host for H.323 TCP traffic over NAT.

**Mapped Port** requires the port number on the mapped host for the H.323 TCP traffic over NAT.

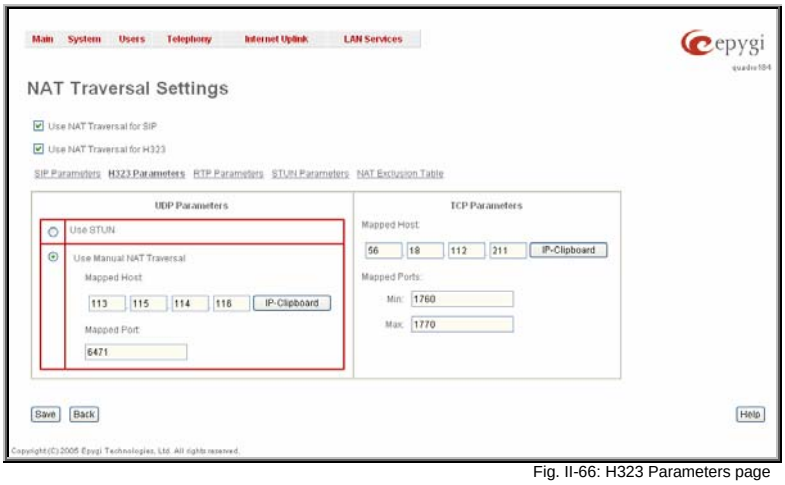

Fig. II-66: H323 Parameters page

The **RTP Parameters** page is used to choose between the STUN and Manual NAT traversal connection for the RTP traffic and to define the RTP/RTCP ports for the connection over NAT.

Manipulation radio buttons allow to select the type of connection over NAT:

Selecting **Use STUN** will switch to automatic discovery of Mapped settings for the RTP UDP traffic over NAT. STUN settings are configured on the STUN Parameters page (see below).

Selecting **Use Manual NAT Traversal** allows to define manually the RTP/RTCP port ranges for the RTP traffic over NAT:

- The **Mapped Host** text fields require the Mapped Host for RTP traffic over NAT.
- **Mapped RTP/RTCP Port Range for FXS Lines:**
  - **Min** - minimal port has to be higher than 1024 and lower than the maximal port range. Only even numbers are allowed.
  - **Max** - maximal port has to be lower than 65536 and higher than the minimal port range. Only odd numbers are allowed.

**Please Note:** RTP/RTCP Mapped Port ranges should be greater than or equal to the RTP/RTCP port ranges defined on the RTP Settings page.

Fig. II-67: RTP Parameters page

Main System Users Telephony Internet Uplink LAN Services
epygi
NAT Traversal Settings
Use NAT Traversal for SIP
Use NAT Traversal for H323
SIP Parameters H323 Parameters RTP Parameters STUN Parameters NAT Exclusion Table
STUN server: stun.epygi.com
STUN Port: 3478
Polling interval: 1 hour
Keep-alive interval: 120 second(s)
Save Back Help

Fig. II-68: STUN Parameters page

The **STUN Parameters** page enables automatic NAT configuration through the STUN server and is used to configure the STUN (Simple Traversal of UDP over NAT) client on the Quadro. The page requires the following data to be inserted:

The **STUN Server** text field requires the STUN server's hostname or IP address. The **STUN Port** text field requires the STUN server port number.

The **Polling Interval** drop down list contains the possible time intervals between referrals to the STUN server.

The **Keep-alive interval** text field gives the possibility to select the time interval (in seconds) for keeping NAT mapping alive.

The **NAT Exclusion Table** page includes a table where all possible IP ranges are listed that allows to exclude some network addresses from being NATed. For example, if a Quadro user needs to make SIP calls within the local network as well as outside of that network, all local IP addresses are required to be excluded from NAT traversal settings by being listed in this table. Otherwise, a malfunction may occur in SIP operations.

The **NAT Exclusion Table** page offers the following input options:

Each record in the table has its checkbox assigned to its row. This checkbox is used to delete or to edit the corresponding record. As only one record may be edited at a time, an error message appears, if none or more than one is selected.

Each column heading in the table is a link. By clicking on the column heading, the table will be sorted by the selected column. Upon sorting (ascending or descending), arrows will be displayed close to the column heading.

The **Add Entry** page includes the following text fields:

**Add** opens the **Add Entry** page where a new IP range can be added.

**Edit** opens the **Edit Entry** page where the IP range can be modified. The page includes the same components as the **Add Entry** page.

The **NAT Exclusion Table** lists all possible IP ranges that are not included into the NAT process, but may be accessed directly. IP addresses that are not listed in the **NAT Exclusion Table** are accessed over NAT.

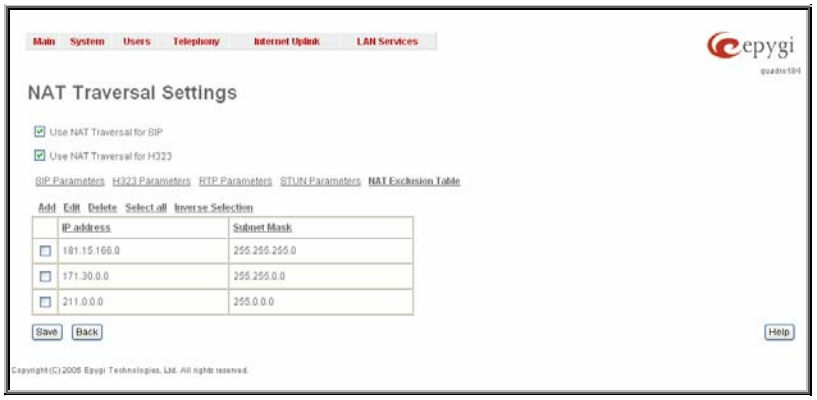
Main System Users Telephony Internet Uplink LAN Services
epygi
NAT Traversal Settings
Use NAT Traversal for SIP
Use NAT Traversal for H323
SIP Parameters H323 Parameters RTP Parameters STUN Parameters NAT Exclusion Table
Add Edit Delete Select all Inverse Selection
IP address Subnet Mask
181.15.166.0 255.255.255.0
171.30.0.0 255.255.0.0
211.0.0.0 255.0.0.0
Save Back Help

Fig. II-69: NAT Exclusion Table page

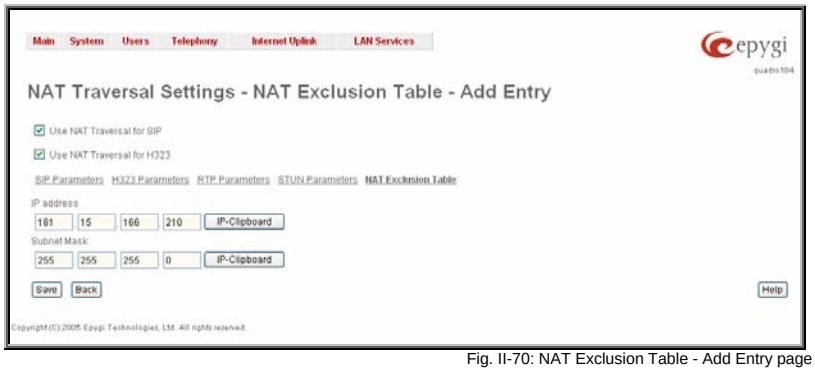
Main System Users Telephony Internet Uplink LAN Services
epygi
NAT Traversal Settings - NAT Exclusion Table - Add Entry
Use NAT Traversal for SIP
Use NAT Traversal for H323
SIP Parameters H323 Parameters RTP Parameters STUN Parameters NAT Exclusion Table
IP address
181 15 166 210 IP-Clipboard
Subnet Mask
255 255 255 0 IP-Clipboard
Save Back Help

Fig. II-70: NAT Exclusion Table - Add Entry page

**IP address** requires the IP address that is placed behind NAT within the local network.

**Subnet Mask** requires the subnet mask corresponding to the specified IP address.

**To Configure the NAT Exclusion Table**

1. Press the **Add** button on the **NAT Exclusion Table** page. The **Add Entry** page will appear in the browser window.
2. Specify an **IP Address** and its **Subnet Mask** in the corresponding text fields.
3. Press **Save** on the **Add Entry** page to add the selected IP range to the **NAT Exclusion Table** list.

**To Delete an IP Range from the NAT Exclusion Table**

1. Select the checkboxes of the corresponding IP range(s) that ought to be deleted from the **NAT Exclusion Table**. Press **Select all** if all IP ranges ought to be deleted.
2. Press the **Delete** button on the **NAT Exclusion Table** page.
3. Confirm the deletion with **Yes**. The IP range will be deleted. To abort the deletion and keep the IP range in the list, press **No**.

## Line Settings

The **Line Settings** page is used to configure Quadro lines and to define the caller ID detection type, configure remote party disconnect indication and select the ringer type on each of them. Additionally this page provides a possibility to enable Loopback diagnostics on the lines.

The page **Onboard Line Settings** shows the table **Available Lines** where all active lines of Quadro are listed with their **Attached Extension** (if attached, else none). Further, the table provides information about the selected **Ringer Type** and **Caller ID** detection method that is configured for the selected line. The caller ID detection method is different for various types of phones and can be found in the phone manual.

The **Loopback Settings** link takes you to the page where lines can be configured for loopback diagnostics purposes.

Fig. II-71: Line Settings Page

When pressing on the line number under the **Available Lines** column, the **Line Settings** page specific for the current line is opened and offers the following input options:

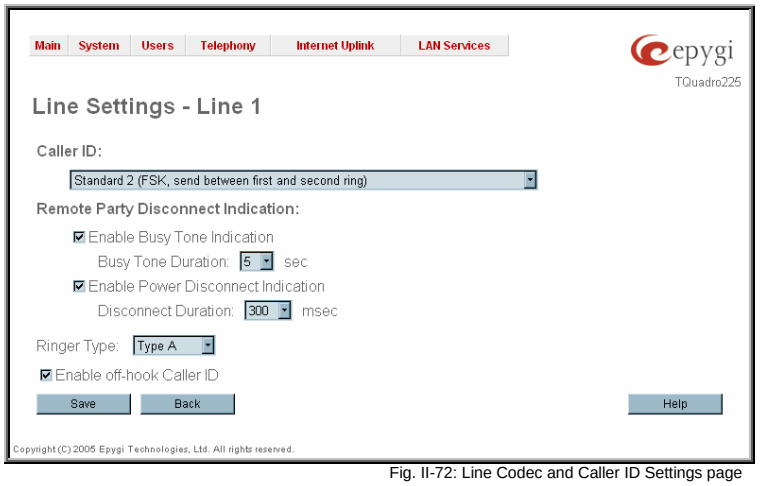


Fig. II-72: Line Codec and Caller ID Settings page

**Caller ID** drop down list contains various standards of Caller ID transmission used to send the calling party's information to the phone attached to the selected line:

- No Caller ID.
- FSK, send prior to the first ring.
- FSK, send between the first and second ring.
- FSK, send both prior to ring and between the first and second ring.
- DTMF, send prior to the first ring.
- DTMF, send between the first and the second ring.
- Combined, send both DTMF prior to the first ring and FSK between the first and the second rings.

The Quadro sends the current time/date to the called phone together with the caller's information.

A group of **Remote Party Disconnect Indication** parameters are used especially to configure the private PBX attached to the Quadro FXS port.

- The **Enable Busy Tone Indication** checkbox enables the busy tone transmission to the FXS port when the remote party being in call is disconnected. The **Busy Tone Duration** drop down list is used to select the period (in seconds) when a busy tone will be transmitted to the FXS port.

The **Ringer Type** drop down list allows to select the frequency of the ringer supported by the phone attached to the line. Information can be found on the phone enclosure or in the phone's manual. Problems with the ringer might occur if the ringer type selected here does not correspond to the one supported by the phone.

**Please Note:** The supported ringer type can be found on the phone bottom, in the "**Ren:x.xN**" value where **N** is the ringer type supported by the phone, (e.g., if N=A, the TypeA ringer type should be selected, if N=B, the TypeB&Z ringer type should be selected).

The **Enable off-hook Caller ID** checkbox enables Caller ID transmission to the phone in the off-hook state attached to the certain line. Service is applicable to the phones supporting the Call Waiting Caller ID feature.

**Information on the Caller ID system:**

**Caller ID** is a service identifying the caller (when performing a call or sending a voice mail) and notifying the called party about the identity of the caller. Caller ID service is available only for phones with a display to show that information. Two types of Caller ID notification are available on Quadro: FSK and DTMF.

**FSK Standard**

The FSK standard supports caller ID indication either with the phone handset on-hook or if the called party is already busy with another call or operation (handset is off-hook). For internal calls, caller ID notification in FSK can show up to two lines of identifiable parameters on the called phone's display. The first line shows the caller's extension number. The second line shows the caller's nickname (if indicated in the configuration). For external IP calls, caller ID notification in FSK can also show up to two lines of identifiable parameters on the called phone's display. The first line shows the caller's user name. The second line shows the caller's nickname (if indicated in configuration). If the nickname is not available and there is a display name, provided by the caller party, the second line will display it, otherwise the URL in the format: username@host will be shown instead. For calls from the PSTN network, the entire caller ID message will be shown, sent by the PSTN station.

**DTMF Standard**

The DTMF standard supports caller ID indication only if the phone handset is on-hook (phone is free and ready to accept calls). This standard also has caller ID notification conditions but they are nonconfigurable as well. Caller ID notification in DTMF can show only one line of identifiable parameter on the called phone's display. For internal calls, it is the caller's extension number. For external IP calls, it is the caller's user name. For calls from the PSTN network, caller ID will display the caller's phone number only.

**Please Note:** DTMF supports only parameters consisting of digits. If any letter symbol has been used in the external caller user name, DTMF will display no caller ID at all.

**To Configure the Line Settings**

1. Select the line number that ought to be configured from the **Active Lines** column on the **Lines** table on the **Line Settings** page
2. Press on the line number link from the **Line Settings** table. The **Line Settings - Line#** page will appear in the browser window.
3. Use the **Caller ID** drop down list to select the caller ID detection system mode corresponding to the phone type.
4. Enable **Dialing Prefix With Caller ID** checkbox if needed.
5. Configure **Remote Party Disconnect Indication** parameters by selecting the corresponding checkboxes.
6. Define a **Ringer Type** from the corresponding drop down list.
7. Enable **Off-hook Caller ID** if needed.
8. Press the **Save** button on the **Line Settings - Line#** page to save the caller ID system and other line specific configuration settings.

## Loopback Settings

The **FXS Lines Loopback Settings** page is used to configure the lines for voice loopback diagnostics. When loopback is enabled on the line, any incoming calls to the corresponding line will be automatically picked up on the first ring and any voice towards the line will be automatically sent back to the caller, i.e., caller will hear themselves in the handset. **Loopback Timeout** gives a possibility to limit the voice loopback diagnostics duration, i.e., caller will be disconnected from the Quadro when the **Loopback Timeout** expires.

The **FXS Lines Loopback Settings** page shows the only table where all FXS lines of the Quadro are listed. Here, loopback diagnostics may be enabled/disabled and the Loopback Timeout can be adjusted for FXS lines.

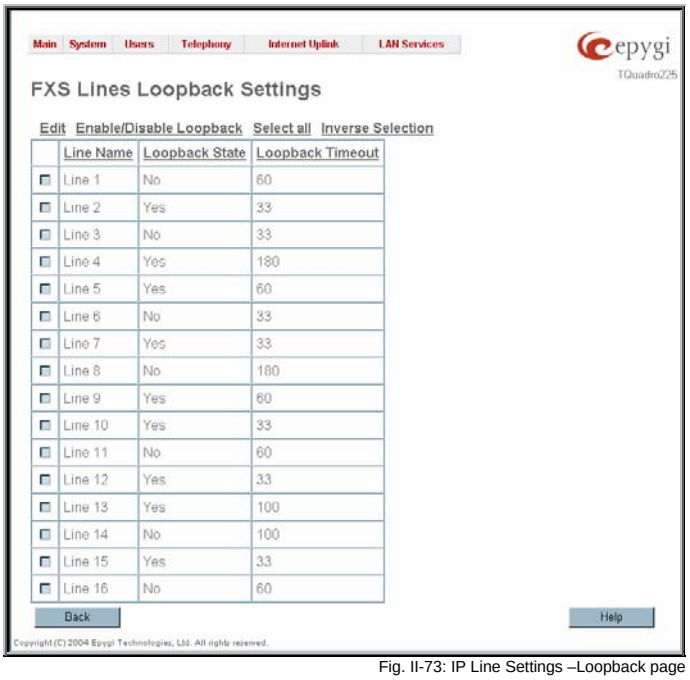

Fig. II-73: IP Line Settings –Loopback page

The **FXS Lines Loopback** table lists all the FXS lines on the Quadro along with their loopback parameters (**Loopback State** and **Loopback Timeou**t).

The **Edit** functional link leads to the **FXS Lines Loopback Settings - Edit Entry** page where **Loopback Timeout** (in seconds) may be configured for one or more selected FXS line(s).

The **Enable/Disable Loopback** functional link is used to enable/disable the Loopback service on the selected FXS line(s).

## E1/T1 Settings

The **E1/T1 service** allows Quadro to be connected to a PBX or to a CO (Central Office) via E1/T1 lines, using E1/T1 CAS/CCS signaling. Quadro may act as a user or as network. If connected to a private PBX, the Quadro should be configured in the network mode. If an E1/T1 trunk from the CO is connected to the Quadro, it should be configured as a user.

The **E1/T1 settings** page is used to configure the E1/T1 trunk and the timeslots settings. The page consists of the following components:

The **Trunk Settings** table lists the available E1/T1 trunks on the Quadro and their settings (Trunk name, E1/T1 mode, interface, signaling types). Clicking on the trunk will open its **Signaling Settings** page (**Trunk CAS Signaling Settings** or **Trunk CCS Signaling Settings** page depending on the selected signaling type) while selecting the corresponding trunk's checkbox and pressing **Edit** will open the **Trunk – Edit Entry** page. **E1/T1 Stats** link is displayed for every active trunk on the board and refers to the page where E1/T1 trunk and traffic statistics can be viewed.

Fig. II-74: E1/T1 Settings page

**Start** and **Stop** functional links are used to start/shutdown the selected E1/T1 trunk(s). When E1/T1 trunk is shutdown state, no E1/T1 calls could be placed and received.

The **Trunk – Edit Entry** page consists of the following components:

The **Interface Type** drop down list gives a option to choose between E1/T1 **User** and **Network** interface configuration.

The **Signaling Type** drop down list allows selection of **CAS** (Channel Associated Signaling) or **CCS** (Common Channel Signaling) signaling types. The same timeslot is used both for voice and data transmission in case of CAS signaling. In the case of CCS signaling a single timeslot is used for signaling data transmission on the entire trunk. All other timeslots are used for voice transmission.

The **E1** and **T1** radio buttons are used to select between E1 and T1 modes. The T1 mode enables 24 timeslots, and the E1 mode enables 32 timeslots to be used. The selection of E1 or T1 enables the **Line Code**, **Frame mode**, **Line Build Out**, **Coding Type, LoopBackMode** and **Clock Mode** settings. These settings are configured to match the E1/T1 settings from the service provider.

**Attention:** See the Call Routing chapter to ensure that modifications to the E1/T1 trunk settings do not lead to broken routes in the Local Call Routing Table.

Fig. II-75: E1/T1 Settings –Edit Entry page

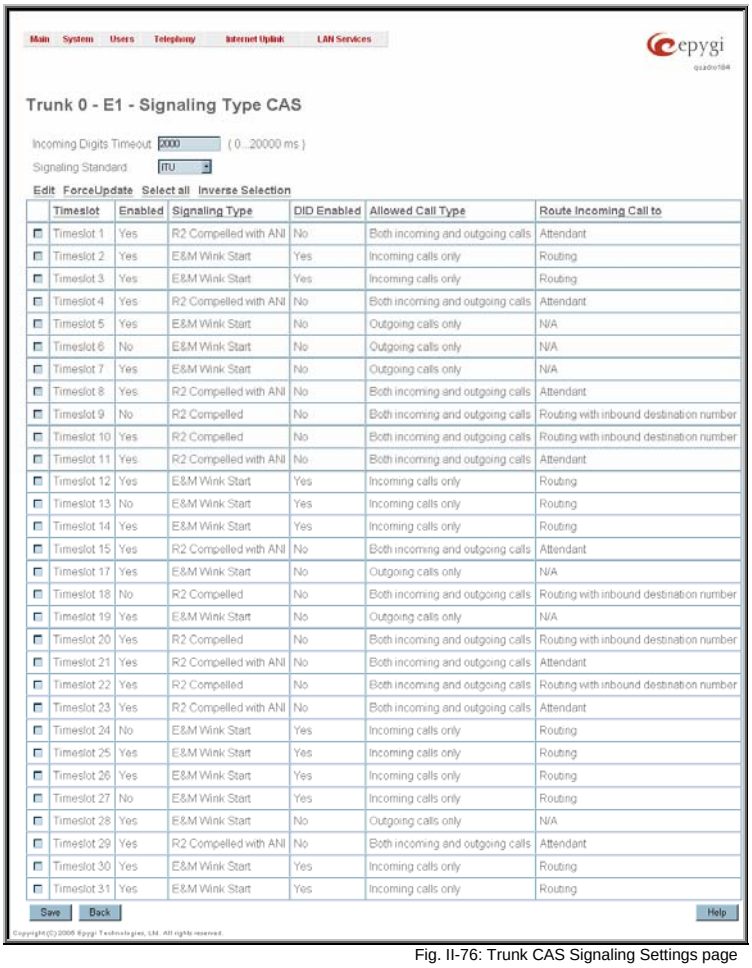
Main System Users Telephony Internet Uplink LAN Services
epygi
Trunk 0 - E1 - Signaling Type CAS
Incoming Digits Timeout 2000 ( 0...20000 ms )
Signaling Standard ITU
Edit ForceUpdate Select all Inverse Selection
Timeslot Enabled Signaling Type DID Enabled Allowed Call Type Route Incoming Call to
Timeslot 1 Yes R2 Compelled with ANI No Both incoming and outgoing calls Attendant
Timeslot 2 Yes E&M Wink Start Yes Incoming calls only Routing
Timeslot 3 Yes E&M Wink Start Yes Incoming calls only Routing
Timeslot 4 Yes R2 Compelled with ANI No Both incoming and outgoing calls Attendant
Timeslot 5 Yes E&M Wink Start No Outgoing calls only N/A
Timeslot 6 No E&M Wink Start No Outgoing calls only N/A
Timeslot 7 Yes E&M Wink Start No Outgoing calls only N/A
Timeslot 8 Yes R2 Compelled with ANI No Both incoming and outgoing calls Attendant
Timeslot 9 No R2 Compelled No Both incoming and outgoing calls Routing with inbound destination number
Timeslot 10 Yes R2 Compelled No Both incoming and outgoing calls Routing with inbound destination number
Timeslot 11 Yes R2 Compelled with ANI No Both incoming and outgoing calls Attendant
Timeslot 12 Yes E&M Wink Start Yes Incoming calls only Routing
Timeslot 13 No E&M Wink Start Yes Incoming calls only Routing
Timeslot 14 Yes E&M Wink Start Yes Incoming calls only Routing
Timeslot 15 Yes R2 Compelled with ANI No Both incoming and outgoing calls Attendant
Timeslot 17 Yes E&M Wink Start No Outgoing calls only N/A
Timeslot 18 No R2 Compelled No Both incoming and outgoing calls Routing with inbound destination number
Timeslot 19 Yes E&M Wink Start No Outgoing calls only N/A
Timeslot 20 Yes R2 Compelled No Both incoming and outgoing calls Routing with inbound destination number
Timeslot 21 Yes R2 Compelled with ANI No Both incoming and outgoing calls Attendant
Timeslot 22 Yes R2 Compelled No Both incoming and outgoing calls Routing with inbound destination number
Timeslot 23 Yes R2 Compelled with ANI No Both incoming and outgoing calls Attendant
Timeslot 24 No E&M Wink Start Yes Incoming calls only Routing
Timeslot 25 Yes E&M Wink Start Yes Incoming calls only Routing
Timeslot 26 Yes E&M Wink Start Yes Incoming calls only Routing
Timeslot 27 No E&M Wink Start Yes Incoming calls only Routing
Timeslot 28 Yes E&M Wink Start No Outgoing calls only N/A
Timeslot 29 Yes R2 Compelled with ANI No Both incoming and outgoing calls Attendant
Timeslot 30 Yes E&M Wink Start Yes Incoming calls only Routing
Timeslot 31 Yes E&M Wink Start Yes Incoming calls only Routing
Save Back Help

Fig. II-76: Trunk CAS Signaling Settings page

The **Trunk CAS Signaling Settings** page lists the available timeslots of the trunk with CAS signaling and their settings.

**Incoming Digits Timeout** text field requires a value between 0 and 20000 (in milliseconds) and is used to define the timeout during which incoming digits from the destination party calling Quadro will be collected before being applied as an incoming called number.

**Signaling Standard** drop down list is available only in E1 mode and is used to select the connection signaling standard.

**Force Update** functional button is used to apply immediately the new settings on the selected timeslot(s). This will force the timeslot(s) to be restarted and any active connection on the selected timeslot(s) will be interrupted.

**Enable/Disable** functional buttons are used to enable/disable the selected timeslot(s).

Select one or more timeslots and click on **Edit** to open the **CAS Signaling Wizard** that guides through the key configuration parameters specific to the timeslot.

The **CAS Signaling Wizard** offers a possibility to configure the selected timeslot(s) and provides a variable group of parameters depending on the E1/T1 trunk configuration.

Fig. II-77: **CAS Signaling Wizard – Page 1**

**CAS Signaling Wizard – Page 1** provides a possibility to enable the **DID (Direct Inward Dialing) Service** on the timeslot(s).

**CAS Signaling Wizard – Page 2** allows to configure signaling type settings and consists of following components:

**Allowed Call Type** is used to select the allowed call directions: incoming, outgoing or both.

**Signaling Type** allows selecting the CAS signaling type.

**Please Note:** R2 signaling (compelled and non-compelled) can only be used with an E1 interface in User mode. Independent on the selection in this drop down list, Quadro with the T1 interface in the CAS mode is unable to detect the busy tone on the destination side. For E1 interface in the CAS mode, busy tone will be detected only for R2 compelled and non-compelled (both with and without ANI) signaling types.

**Force Update Timeslots** checkbox can be optionally selected in order to apply new settings immediately. This will force the timeslot(s) to be restarted and any active connection on the selected timeslot(s) will be interrupted.

**Please Note:** Quadro does not support the **Forward Digit** selected on the CO when acting in the **User** mode with **CAS Loop Start** signaling type.

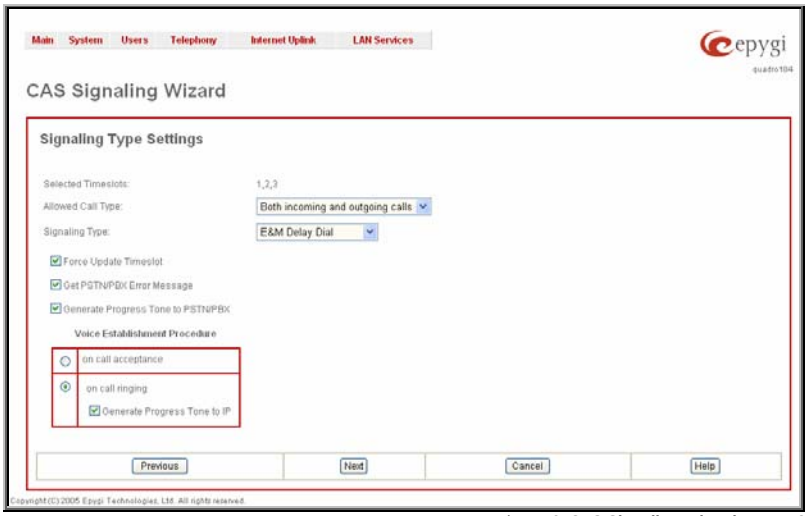


Fig. II-78: **CAS Signaling Wizard – Page 2**

**Get PSTN/PBX Error Message** checkbox enables notification message in case of outgoing calls to unreachable, incorrect or non existent destination.

When **Generate Progress Tone to PSTN/PBX** checkbox is selected, Quadro generates ring tones to incoming callers during E1/T1 call dialing. This feature is mainly applicable to 2-stage dialing mode.

**Voice Establishment Procedure** manipulation radio buttons group is used to select a method of voice establishment on the trunk:

- **On call acceptance** – with this selection, voice will be established after call is being accepted.
- **On call ringing** - with this selection, voice will be established after call is being ringing. Selection enables **Generate Progress Tone** checkbox which is used to enable the progress tone generation upon voice establishment.

**CAS Signaling Wizard – Page 3** allows to set the destination for incoming calls to be routed to and to enable **Cut Through** and **Automat Ringing Down** services for signaling different from R2 (all types).

**Route Incoming Call to** drop down appears when **Both incoming and outgoing calls** or **Incoming calls only** is selected from the **Allowed Call Type** list and allows selecting the destination where incoming calls should be routed. The list contains all extensions of the Quadro, Attendant and Routing agent. The routing agent gives two kinds of call routing possibilities in user mode and one in network mode. Choosing the **Routing** selection (available in User mode only) will request the caller to pass the authentication (if enabled) and will invite the caller to dial the destination number to connect the user within the Quadro Network. Choosing the **Routing with inbound destination number** selection will automatically use the initially dialed number to connect the destination without any additional dialing.

When **DID service** is enabled (in User mode only), incoming calls can be only routed to the Routing agent with simple **Routing** and **Routing with inbound destination number** call routing possibilities.

Fig. II-79: **CAS Signaling Wizard – Page 3**

**Attention:** When Quadro acts in the Network mode with the Attendant as a destination to route the incoming calls, digit forwarding should be disabled on the PBX side. Otherwise, incoming digits may be mistaken as special calling codes on the Quadro's Attendant.

**Cut Through** checkbox is available when signaling selected from the **Signaling Type** drop down list on the **CAS Signaling Wizard – Page 2** is different from R2 (all types) and is used to reconnect the call (terminated by some reason, e.g. user error, network problems, etc.) by going on-hook and off-hook again even if the call partner is off-hook and not involved in the call.

**Automat Ringing Down** checkbox is available when signaling selected from the **Signaling Type** drop down list on the **CAS Signaling Wizard – Page 2** is different from R2 (all types) and allows an E1/T1 device connected to the Quadro to establish a hot-line call (automatic call without any digits dialed).

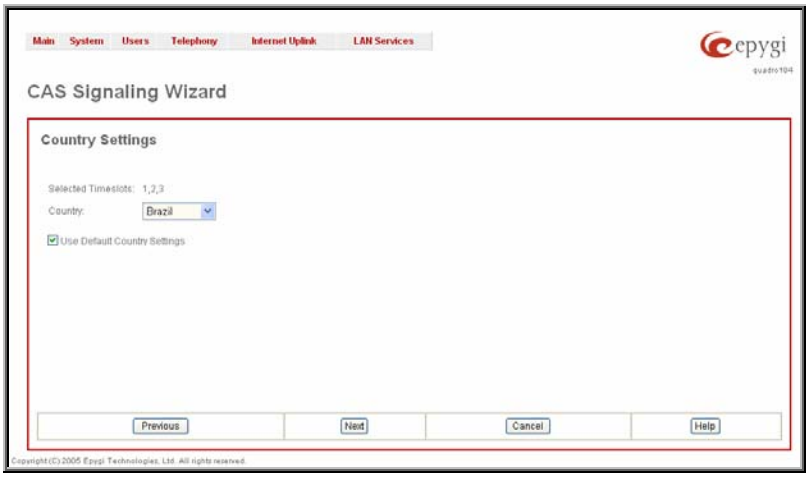


Fig. II-80: **CAS Signaling Wizard – Page 4**

**CAS Signaling Wizard – Page 4** appears only in E1 User mode when signaling selected from **Signaling Type** drop down list on the **CAS Signaling Wizard – Page 2** is R2 (all types) and is used to configure country settings. Page consists of the following components:

**Country** drop down list is used to set the location where Quadro is located to support the correct functionality of R2 signaling. For countries absent in this list, use **ITU** selection.

**Use Default Country Settings** checkbox restores default advanced settings for the selected country. When this checkbox is not selected, next page will provide a possibility to manually configure advanced country settings.

**CAS Signaling Wizard – Page 5** appears only when **Use Default Country Settings** checkbox is not selected on the previous page and is used to configure advanced country settings. Page consists of the following components:

**ANI Category** drop down list appears only when **R2** signaling selected from **Signaling Type** drop down list on the **CAS Signaling Wizard – Page 2** is different from **R2 DTMF** and is used to select the calling party priority depending on the call originator's location specifics.

**Seize Acknowledge Timeout** text field is used to define a timeout (in a range from 2 to 2000 milliseconds) between incoming seize signal and the corresponding feedback.

**Answer Guard Timeout** text field is used to define a wait timeout (in a range from 0 to 1000 milliseconds) Group-B Answer Signal and Line Answer.

**Release Guard Timeout** text field is used to define an idle timeout (in a range from 0 to 10000 milliseconds) between the disconnect signal receipt and call disconnection.

**Dialing Delay Timeout** text field is used to define a timeout (in a range from 0 to 2000 milliseconds) before injecting dialed digits. Timeout specially refers to R2 DTMF signaling.

**Incoming DNIS Size** text field indicates the number of received digits (in a range from 0 to 255) required to establish a call. When field has 0 value, system uses either timeout defined in the **Incoming digits timeout** field or the **End of Address** messages to establish a call. Independent on the value in this field, the message **End of Address** always cause the call establishment.

**Ususued A:B:C:D** text fields require to configure unused C and D bits of E1/T1 CAS signaling (A and B bits are predefined). Fields may have either 0 or 1 values.

**Invert A:B:C:D** text fields are used to invert the ABCD status bits in time-slot 16 before TX and after RX. If bit is set to 1, the router inverts it before transmission and after the receipt.

**End of DNIS** (I-15) checkbox is used to enable End of DNIS service.

**Collect Call** checkbox is only available when **Brazil** is selected in the **Country** drop down list on the previous page of the wizard and when the PBX attached to the Quadro supports this feature. When this checkbox is selected and in case of incoming calls, always the called destination will pay for the call. Option is particularly applicable when calling from the mobile phone. Checkbox should be selected when the appropriate feature is enabled on the PBX.

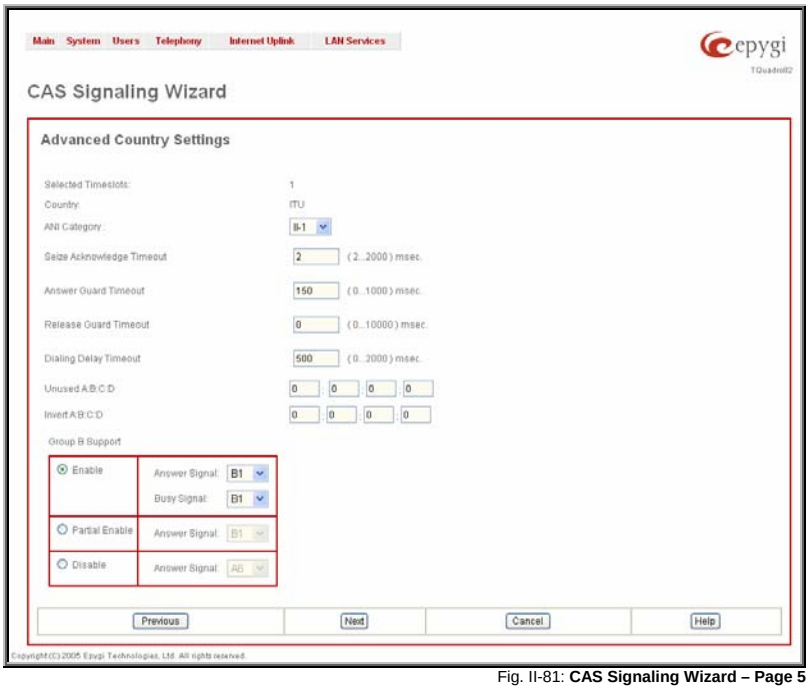


Fig. II-81: **CAS Signaling Wizard – Page 5**

**Group B Support** manipulation radio button group is present only when **R2** signaling selected from **Signaling Type** drop down list on the previous page is different from **R2 DTMF** and is used to enable/disable the **Group B Support**. The **Group B Support** manipulation radio button group offers following selection:

- **Enable** – selection enables **Group B Support** (both answer and busy recognitions are performed) and requires defining **Answer Signal** and **Busy Signal** parameters.
- **Partial Enable** – selection partially enables **Group B Support** (only answer recognition is performed) and requires defining the **Answer Signal** parameter.
- **Disable** – selection disables **Group B Support** and requires defining the **Answer Signal** parameter.

The **Trunk CCS Signaling Settings** page allows configuring CCS signaling settings and gives a possibility to select timeslots for signaling data transfer/receive and voice transfer. The page consists of the following components:

The **Non Automat** checkbox switches to non-automatic Terminal Endpoint Identifier (TEI) searching and enables the **TEI Address** text field that requires a TEI number (digit values from 0 to 63) for connection establishment between CO and E1/T1 client. In automatic mode, an E1/T1 connection will be established on the first available TEI, while in non-automatic mode a specific TEI may be reserved for the connection. In this case both call partners need to specify the same TEI in their settings.

In the **Network Mode** (PBX connected):

- If **Non Automat** mode is selected, the same **TEI address** should be specified on both sides-Quadro and PBX.
- If **Automat** mode is selected the user on PBX side will have the opportunity to set any mode related to TEI assignment in PBX configuration. This will allow PBX connection to the Quadro without providing the TEI address from Quadro.

In the **User Mode** (CO connected) the TEI assignment is dependent on CO settings:

- Select **Non Automat** mode and insert the same **TEI address** provided by CO.
- Select any mode related to TEI assignment if automat TEI searching mode is selected on CO side.

Two groups of timers need to be provided. These settings are adjusted according to the Service Provider requirements.

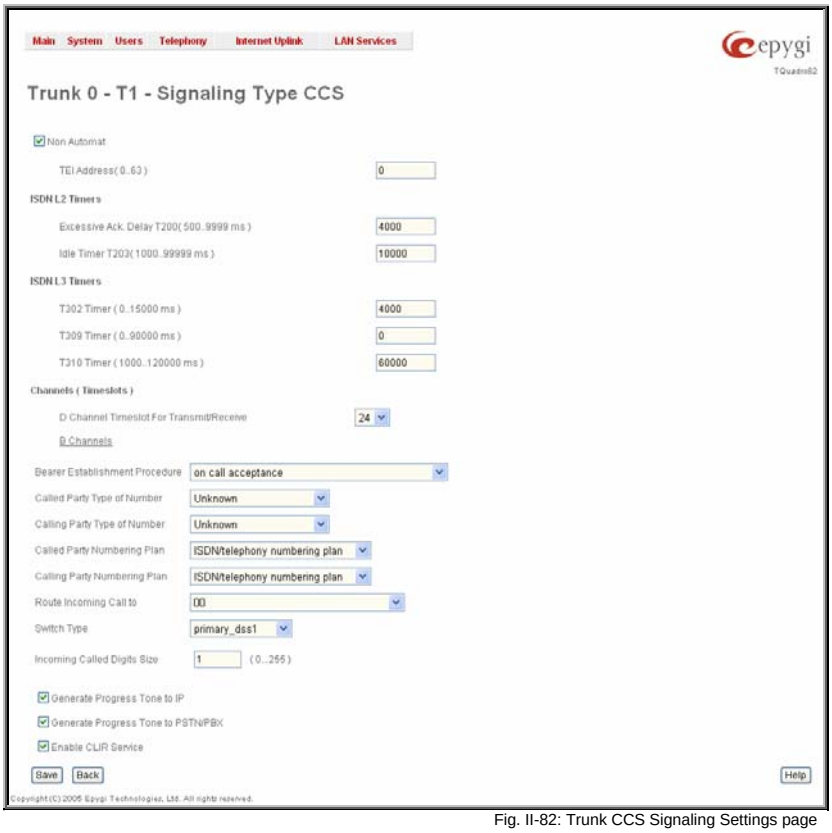

Fig. II-82: Trunk CCS Signaling Settings page

**ISDN L2 Timers:**

- The **Excessive Ack. Delay T200** text field configures the period in milliseconds (digit values from 500 to 9999) between transmitted signaling packet and its acknowledgement received.
- The **Idle Timer** T203 text field configures the period in milliseconds (digit values from 1000 to 99999) for E1/T1 client idle timeout.

**ISDN L3 Timers:**

- The **T302 Timer** text field requires the value for the T302 timer in milliseconds (digit values from 0 to 15000) and indicates the time frame system is waiting for digit to be dialed and when timer expires, it initiates the call. Timer is not applicable for DMS-100 switch types.
- The **T309 Timer** text field requires the value for the T309 timer in milliseconds (digit values from 0 to 90000) responsible for call steadiness during link disconnection within the period equal to this timer value. If the value in this field is 0, T309 timer will be disabled.
- The **T310 Timer** text field requires the value for the T310 timer in milliseconds (digit values from 1000 to 120000) responsible for the outgoing call steadiness when CALL PROCEEDING is already received from the destination but call confirmation (ALERT, CONNECT, DISC or PROGRESS) is not yet arrived.

The **D Channel Timeslot For Transmit/Receive** drop down list contains the timeslots to be selected for signaling data transmit/receive.

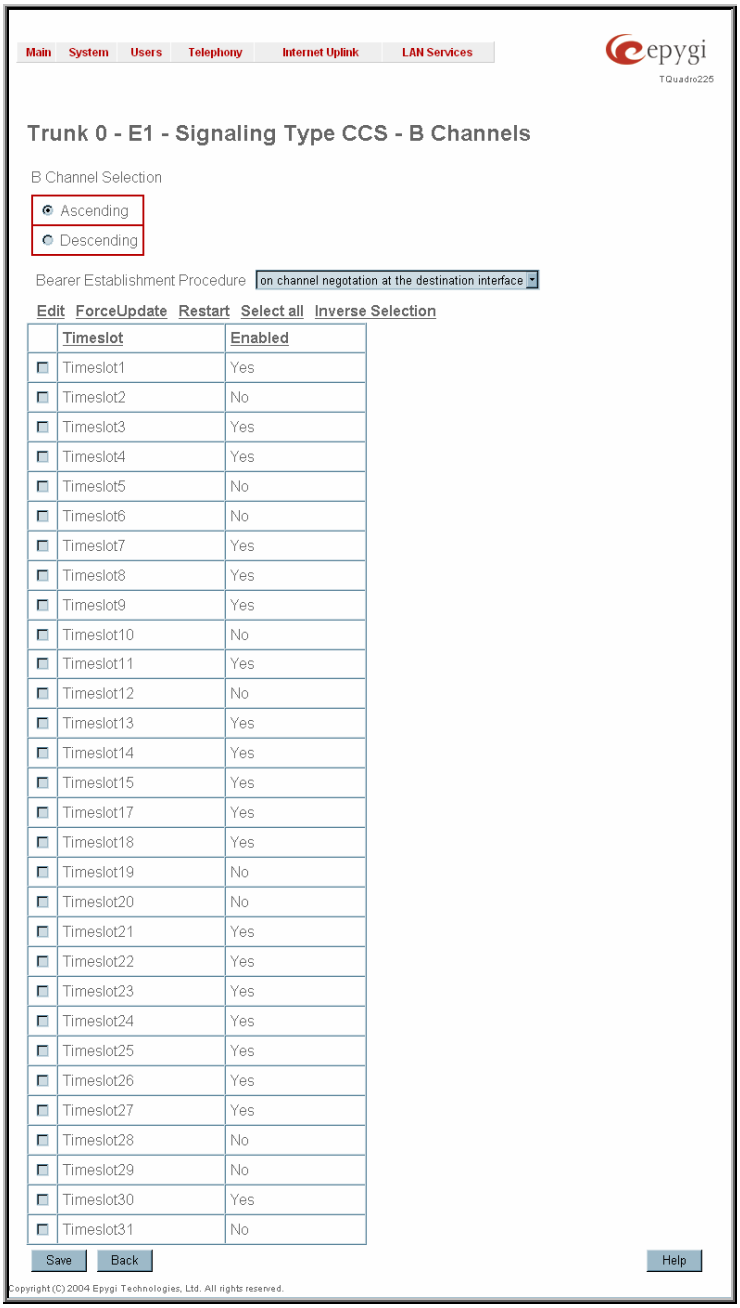


Fig. II-83: Trunk CCS Signaling Settings – B Channels page

The **B Channel** link leads to the **Signaling Type CCS – B Channel Settings** page where available timeslots may be enabled/disabled for the voice transfer. The **Force Update** option can be optionally used to apply new settings immediately. The **Restart** option is used to bring timeslot(s) to the initial idle state on the both sides. When applying one of these options, any active traffic on the timeslot(s) will be terminated.

**Channel Selection** drop down list is used to select between the **Preferred** and **Exclusive** B channel selection methods. For **Preferred** channel selection, the CO answers to the call request by the first available timeslot, while for **Exclusive** channel selection CO should feedback only by the timeslot used for the call request.

**Channel Selection Ordering** drop down list is used to choose the B channels selection (Ascending or Descending). When **Ascending** selection is configured, B channels will be defined starting from B1 to B23/B30. For **Descending** selection, B channels will be defined from B23/30 to B1. If your CO/PBX has **Ascending** B channels selection configured, it is recommended to use **Descending** B channels selection and vice versa.

**Please Note:** A timeslot can be used either for voice or data transfer. The system prevents selecting a timeslot from the B channel list if it has already been selected from the D Channel receive/transmit drop down list.

The **Bearer Establishment Procedure** drop down list allows to select the session initiation method on the B channels. One of the following possibilities of the transmission path completion prior to receipt of a call acceptance indication can be selected:

- on channel negotiation at the destination interface;
- on progress indication with in-band information;
- on call acceptance.

The **Calling Party Type of Number** drop down list allows to select the type identifying the origin of call.

The **Called Party Type of Number** drop down list allows to select the type identifying the subaddress of the called party of the call.

The **Called Party Numbering Plan** and **Calling Party Numbering Plan** drop down lists indicates correspondingly the numbering plan of the called party's and calling party's number.

The **Route Incoming Call to** drop down list contains Attendant, routing agent with two kinds of call routing possibilities, and all extensions of Quadro and allows selecting the destination where incoming calls will be routed to. Choosing the "**Routing**" selection will request the caller to pass the authentication (if enabled) and will invite him to dial the destination number to connect the user within the Quadro Network. Choosing the "**Routing with inbound destination number**" selection will request the authentication (if enabled) and then will automatically use the initially dialed number to connect the destination without any additional dialing.

**Attention:** When Quadro acts in the Network mode with the Attendant as a destination to route the incoming calls to, digit forwarding should be disabled on the private PBX side otherwise incoming digits may be mistaken as a special calling codes on the Quadro's Attendant.

**Switch Type** is another configuration parameter that depends on the Service Provider when acting in the User mode and the private PBX capabilities when acting in the Network mode.

**Incoming Called Digits Size** text field indicates the number of received digits (in a range from 0 to 255) required to establish a call. When field has 0 value, system uses either timeout defined in the T302 field or the **Sending Complete Information element** messages to establish a call. Independent on the value in this field, **Sending Complete Information element** and pound sign always cause the call establishment.

The **Generate Progress tone on IP** checkbox selection will generate the progress tone to IP (H.323 or SIP).

When **Generate Progress Tone to PSTN/PBX** checkbox is selected, Quadro generates ring tones to incoming callers during E1/T1 call dialing. This feature is mainly applicable to 2-stage dialing mode.

**Enable CLIR Service** checkbox selection enables Calling Line Identification Restriction (CLIR) service which displays the incoming caller ID only in case if Presentation Indication is allowed on the remote side. Otherwise, if CLIR service is disabled, caller ID will be unconditionally displayed.

The **E1/T1 Trunk Status** page provides information about the selected trunk state. Following information is displayed on this page:

- **E1/T1 mode** - displays which mode is selected: E1 or T1.
- **Interface Type** - displays selected interface type: User or Network.
- **Signaling Type** - displays selected signaling type: CAS or CCS.
- **Clock Mode** - displays the selected clock mode: Master or Slave.
- **Framing mode** - displays selected framing mode.
- **Link** - displays E1/T1 link state: up or down.
- **Frame Synchronization** - displays the signal synchronization state in the trunk: Yes or No.
- **Red Alarm** - indicates that the receive frame alignment for the line has been lost and the data cannot be properly extracted. The red alarm is indicated by the loss of frame condition for the various framing formats.
- **Out of Frame** - number of Out of Frame errors.
- **Line Code Violation** - number of Line Code Violation errors.
- **Frame Synchronization** - number of Frame Synchronization errors.
- **Link Synchronization** - number of Link Synchronization errors.

The following statistics are available, if **CAS Signaling** is selected:

- **Active Calls** - currently active calls in the selected trunk.
- **Outgoing Calls** - total outgoing calls in the selected trunk.
- **Incoming Calls** - total incoming calls in the selected trunk.

Following statistics is available when **CCS Signaling** is selected:

**ISDN PRI Layer** statistics:

- **Received Packets** - number of received packets.
- **Received Errors** - number of received errorneous packets.
- **Transmitted Packets** - number of transmitted packets.
- **Transmitted Errors** - number of transmitted errorneous packets.

**ISDN PRI Layer 2** statistics is displayed for actual TEI value and the received and transmitted packets:

- **TEI Value** – the actual TEI assigned
- **L2 State** – the state of the TEI assignment
- **Information Frame** - signaling packets for call initiation and termination.
- **Receive Ready** - controlling packets during E1/T1 link is up.
- **Receive Not Ready** - controlling packets in case of inability to accept calls by destination.
- **SABME** - packets upon connection establishment.
- **Disconnected Mode** - packets when connection is being disconnected.
- **Disconnect** - packets upon connection termination.
- **Unnumbered Acknowledgement** - packets upon accepting connection establishment/termination.
- **Framer** - packets as a report of an error condition.
- **TEI** - packets containing TEI (Terminal Endpoint Identifier) to initiate subscription of the device in the network.
- **Unnumbered Information Frame** - broadcast signaling packets received for call initiation and termination.
- **Exchange Identifi**cation - received packets containing connection management settings.

**ISDN PRI Layer 2 Errors** statistics:

- **Incorrect Length** - packets with incorrect length.
- **Bad Supervisory Frame** - packets with incorrect supervisory header.
- **Bad Unnumbered Information Frame** - packets with incorrect unnumbered information frame header.
- **Bad Frame Type** - packets with bad frame type.
- **Bad Unnumbered Frame** - packets incorrect unnumbered acknowledgement frame header.
- **Bad TEI Value** - packets with bad TEI (Terminal Endpoint Identifier) value.

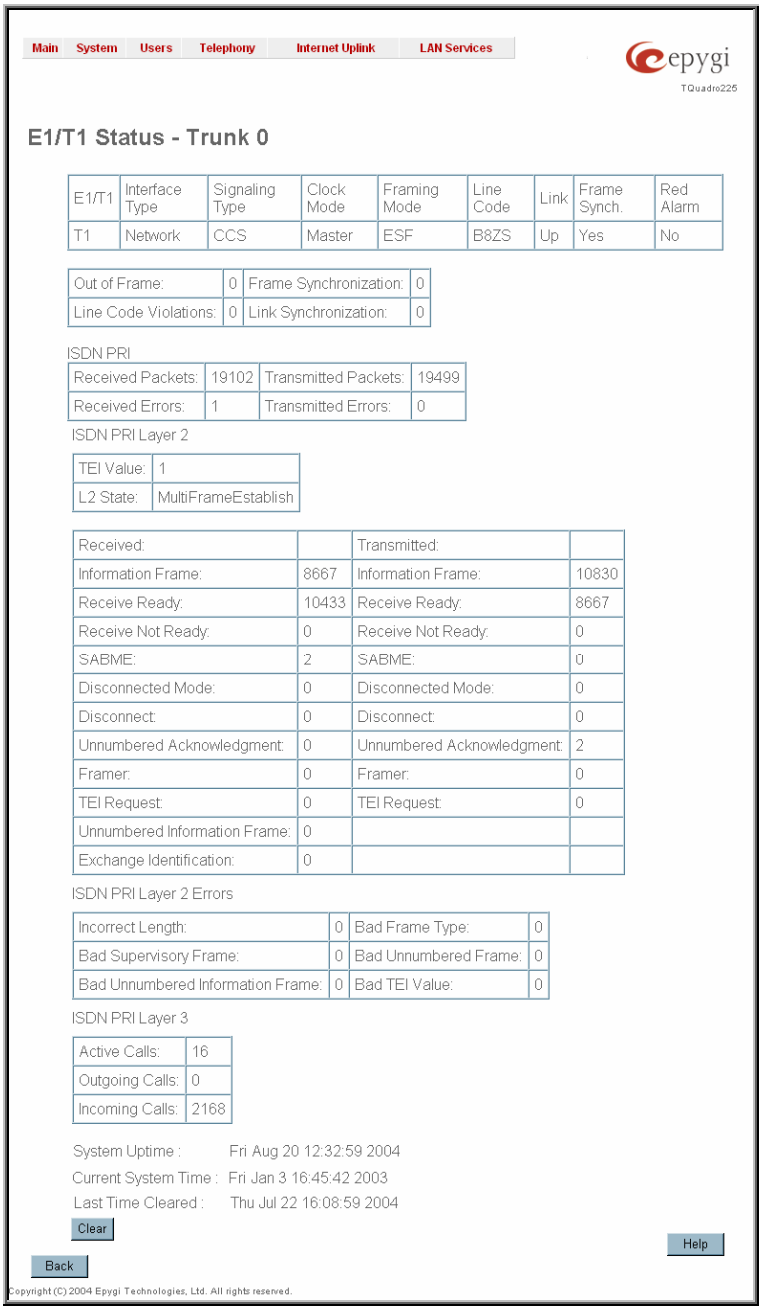
Main
System
Users
Telephony
Internet Uplink
LAN Services
epygi
TQuadro225
E1/T1 Status - Trunk 0
E1/T1 | Interface Type | Signaling Type | Clock Mode | Framing Mode | Line Code | Link | Frame Synch. | Red Alarm
T1 | Network | CCS | Master | ESF | B8ZS | Up | Yes | No
Out of Frame: 0 | Frame Synchronization: 0
Line Code Violations: 0 | Link Synchronization: 0
ISDN PRI
Received Packets: 19102 | Transmitted Packets: 19499
Received Errors: 1 | Transmitted Errors: 0
ISDN PRI Layer 2
TEI Value: 1
L2 State: MultiFrameEstablish
Received: | Transmitted:
Information Frame: 8667 | Information Frame: 10830
Receive Ready: 10433 | Receive Ready: 8667
Receive Not Ready: 0 | Receive Not Ready: 0
SABME: 2 | SABME: 0
Disconnected Mode: 0 | Disconnected Mode: 0
Disconnect: 0 | Disconnect: 0
Unnumbered Acknowledgment: 0 | Unnumbered Acknowledgment: 2
Framer: 0 | Framer: 0
TEI Request: 0 | TEI Request: 0
Unnumbered Information Frame: 0
Exchange Identification: 0
ISDN PRI Layer 2 Errors
Incorrect Length: 0 | Bad Frame Type: 0
Bad Supervisory Frame: 0 | Bad Unnumbered Frame: 0
Bad Unnumbered Information Frame: 0 | Bad TEI Value: 0
ISDN PRI Layer 3
Active Calls: 16
Outgoing Calls: 0
Incoming Calls: 2168
System Uptime : Fri Aug 20 12:32:59 2004
Current System Time : Fri Jan 3 16:45:42 2003
Last Time Cleared : Thu Jul 22 16:08:59 2004
Clear
Help
Back
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Fig. II-84: E1/T1 Trunk Stats page

**ISDN PRI Layer 3** statistics shows the same information as for CAS signaling.

No E1/T1 trunk statistics is displayed in this page at first, but page is getting automatically refreshed every 10 minutes. Statistics collected since that time and the last resetting of the counter will be displayed here.

**Current System Time** displays the actual time on the Quadro and the **Last Time Cleared** displays the exact date and time when the E1/T1 Stats has been manually cleared last time. **System Uptime** displays the period Quadro is on since last reboot.
To reset the statistics counters press the **Clear** button.

## Gain Control

The **Gain Control** settings are used to define the transmit and receive gains. For FXS lines **Transmit Gain** defines the phone speaker volume and **Receive Gain** defines the phone microphone volume. For E1/T1 trunks **Transmit Gain** defines the level of voice transmitted by Quadro to the E1/T1 network and **Receive Gain** defines the volume of voice received by Quadro from the E1/T1 network.

The **Gain Control** page consists of the **Transmit Gain** and **Receive Gain** drop down lists for each line that contain allowed gain values which can be set up by the administrator for every line.

**Please Note:** If gain control is configured incorrectly, DTMF digits may not be recognized properly. The gain control settings depend solely on the board location (country) and the phone type.

The **Restore Default Gains** button restores the default values.

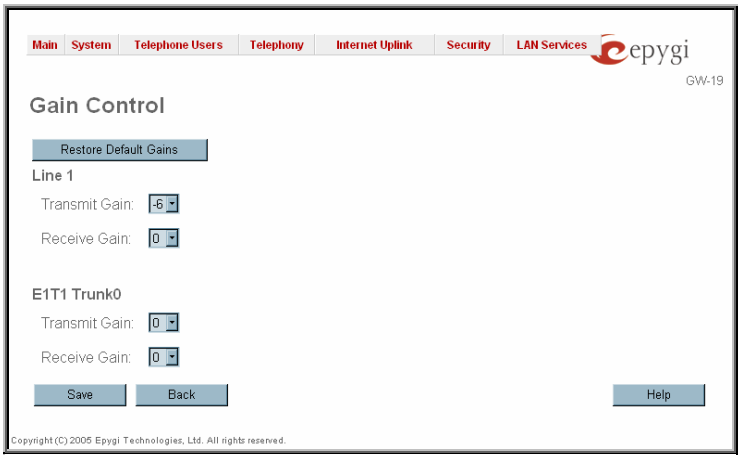



Fig. II-85: Gain Control page

## Call Routing

The **Call Routing** service simplifies the calling procedure for Quadro users, i.e., any kind of calls (internal, SIP, H323, PSTN or IP-PSTN) can be placed in the same way. No SIP registration is needed for extensions to make routing calls.

The **Call Routing** page offers the following components:

- The **Route all incoming SIP calls to Call Routing** checkbox that is used to route ALL incoming SIP calls (whether the pattern matches the extension's SIP registration username or not) to the Local Routing table. No digits will be stripped in this case.
- The **Route all incoming H323 calls to Call Routing** checkbox that is used to route ALL incoming H.323 calls (whether the pattern matches the extension's H.323 registration username or not) to the Local Routing table. No digits will be stripped in this case.
- The **Local Routing Table** link leads to the **Local Routing** table where routing patterns may be defined manually.
- The **Local AAA Table** link leads to the page where local AAA (Authentication, Authorization, and Accounting) database can be managed.

Fig. II-86: Call Routing page

Main System Users Telephony Internet Uplink LAN Services
epygi
Call Routing - Local Routing
Enable Disable Add Edit Duplicate Delete Select all Inverse Selection Move Up Move Down Move To
ID State Pattern NDS Prefix Call Type UES Destination Address ML URP AAA Required Port ID TS Fail Reason Inb Caller Pattern Inb NDS Inb Prefix Inb Call Type Inb Server Inb Port ID Inb TS DT Period (s) Metric Description
1 Disabled 666 3 E1/T1 4-15,17-31 None 10
2 Disabled * 99 111 SIP 172.30.0.122:5060 No No None * E1/T1 Any 10
3 Disabled 222 3 00 PBX No None 10
4 Disabled " E1/T1 No E1/T1 Trunk0 None 10
5 Disabled * 99 636.....1 E1/T1 No E1/T1 Trunk0 1-15,17-31 None 10
6 Disabled * 99 E1/T1 No E1/T1 Trunk0 1-15,17-31 None 10
7 Disabled 875 E1/T1 No E1/T1 Trunk0 None 10
9 Disabled 5557??? 3 741 SIP sip.epygi.com:5060 No No None 102030 6 7411234 E1/T1 E1/T1 Trunk0 10 Calls to sip.epygi.com
9 Disabled 1 E1/T1 No E1/T1 Trunk0 4-15,17-31 None 10
10 Enabled 184 E1/T1 No E1/T1 Trunk0 1-15,17-31 None 10
11 Disabled * H323 (e164) 192.168.25.155:1760 No No None * E1/T1 E1/T1 Trunk0 1-15,17-31 10
12 Enabled 9* 1 E1/T1 No E1/T1 Trunk0 1-15,17-31 None 10
13 Enabled 777 SIP 192.168.75.204:5060 No No None 10
14 Enabled 333 3 00 PBX No None * E1/T1 Any 10
NDS - Number of Discarded Symbols
UES - Use Extension Settings
ML - Multiple Logons
URP - Use RTP Proxy
TS - Timeslots
Inb - Inbound
DT - Date/Time
Back
Help

Fig. II-87: Local Routing table

Defining patterns in the **Local Routing Table** avoids registering Quadro at the routing management server and gives a possibility to establish a direct connection to the destination or to use a SIP server or H.323 Gatekeeper for call routing.

The **Local Routing Table** lists manually defined routing patterns along with their parameters (pattern number, state, routing and inbound caller settings, RTP Proxy and Date/Time period settings, metric and description). The value **invalid** is displayed beside the E1/T1 routing pattern, if the E1/T1 trunk settings (E1/T1 interface type, signaling type, etc.) have been changed since defining the corresponding route. Invalid E1/T1 patterns will not be allowed.

Since **Local Routing Table** may have multiple entries that could match to same pattern, the table will be internally rearranged according to the rules with these consequences:

- The pattern matching best to the Best Matching algorithm will have the higher position in the rearranged list
- If multiple patterns equally match to the Best Matching algorithm, the pattern with the lower metric will get the higher position in the rearranged list
- If the multiple patterns with the same metric have been matched to the Best Matching algorithm, the pattern in the higher position in the table will get the higher position in the rearranged list.

The pattern in the highest position of the rearranged list will be considered as the preferred one. Second and subsequent matching patterns will be used, if the destination refused the call due to the configured Fail Reason.

The **Enable/Disable** functional buttons are used to enable/disable the selected route(s). Disabled routes will take no effect while enabled routes will be parsed when initiating routing calls. The **State** column in the **Local Routing Table** displays the current state of the routes (enabled/disabled).

**Add** starts the **Local Call Routing Wizard** where a new routing pattern may be defined. The **Local Call Routing Wizard** is divided into several pages: Page 1 displays the following components:

**Pattern** requires entering the routing pattern's identification. To make a specified call, the appropriate routing pattern should be dialed. Wildcards are allowed here (see chapter Entering a SIP Addresses correctly). '[' , ']' , ',', '-', '{', '}' are used to define a range or a quantity of numbers, '!' symbol is used for exclusion ("!5a" inserted in Pattern field means all patterns except those equal to 5a). For example, 2{13-17, ww, a-c} means that the dialed number may be 213, 214, 215, 216, or 217, 2ww, 2a, 2b and 2c to match the specified pattern; in the case of 2[3,7], the dialed number may be 23 or 27 to match the specified pattern.

**Number of Discarded Symbols (NDS)** requires the number of symbols that should be discarded from the beginning of the routing pattern. The field should be empty if no digits need to be discarded. Only numeric values are allowed for this field, otherwise an error message occurs: "Error: Number of Discarded Symbols is incorrect - digits allowed only".

**Prefix** requires entering the symbols (letters, digits and any characters supported in the SIP username) that will be placed in front of the routing pattern instead of the discarded digits.

**Suffix** requires entering the symbols (letters, digits and any characters supported in the SIP username) that will be placed in the end of the routing pattern. (For example, if the routing **Pattern** is 12345, the **Number of Discarded Symbols** is two, and the **Prefix** is 909 and **Suffix** is 0a, the final phone number will be 9093450a.)

**Call Type** gives a possibility to select the call type (PBX, H323, SIP, IP-PSTN or E1/T1).

**Metric** allows entering a rating for the selected route in a range from 0 to 20. If no value is inserted to this field, 10 will be taken as the default. If two route entries match a user's dial string, the route with the lower metric will be chosen.

The **Description** text field requires an optional description of the routing pattern.

The **Filter on Caller / Call Type / Modify Caller ID** checkbox selection allows limiting the functionality of the current route to be used by the defined caller(s) only. If this checkbox is enabled, inbound caller information (**Inbound Caller Pattern**, **Inbound Call Type, Inbound Port ID**, etc.) will be required later in the **Local Call Routing Wizard**.

The **Set Date / Time Period(s)** checkbox selection allows to define a validity period(s) for current routing pattern to take place and to define pattern date/time rules. When this checkbox is enabled, **Local Call Routing Wizard** - Page 5 will be displayed.

The second page of the **Local Call Routing Wizard** offers different components depending on the **Call Type** selected on the previous page.

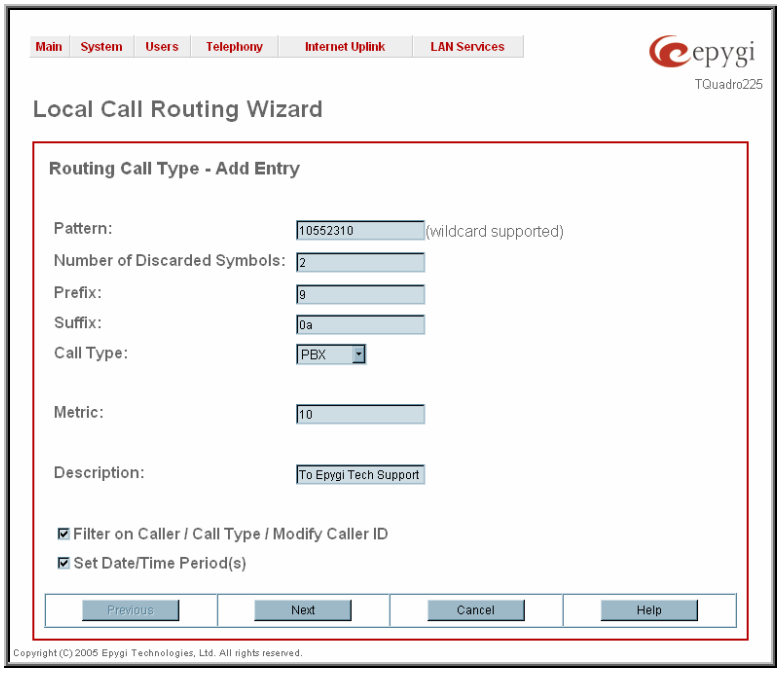



Fig. II-88: Local Routing Wizard - page 1

**Use Extension Settings** is applicable to SIP, H323 and IP-PSTN call types only and allows to select the extension (also Auto Attendant) on behalf of the call that will be placed. The SIP and H323 settings of the selected extension will be used as the caller information. If no entry is selected in this list, the original caller information will be kept. When **Keep original DID** checkbox is selected, called destination will receive the original caller's information, rather than the information of extension selected from the **Use Extension Settings** list.

**Destination Host** requires the IP address or the host name of the destination (for a direct call) or the server (for calls through the SIP server or H323 gatekeeper).

**Destination Port** requires the port number of the destination or of the SIP server or H323 gatekeeper.

**H323 Alias** field is actual for H323 call type only and may contain different characters: for **e164** user name type digit characters allowed only, **h323-ID** user name type allows any characters for the registration user name.

**User Name** and **Password** require the identification settings for the public SIP server or servers requiring authentication.

The **Multiple Logons (ML)** checkbox is available only for the IP-PSTN call type and allows/denies multiple logon to the public SIP server or H.323 gatekeeper with the same username at the same time.

Fig. II-89: Local Routing Wizard - page 2

**Use RTP Proxy** checkbox is available for SIP, H323 and IP-PSTN call types and is applicable only when route is used for calls through Quadro between peers both located outside the Quadro. When this checkbox is selected, RTP streams between external users will be routed through Quadro, otherwise, when checkbox is not selected, RTP packets will be moving directly between peers.

A group of **AAA Required** checkboxes is used to choose one or more Authentication, Authorization, and Accounting (AAA) settings:

- **Local Authentication** – with this checkbox selected, callers will need to pass authentication through Local AAA table (see below) when dialing the current pattern.
- **RADIUS Authentication and Authorization** – checkbox is present for all call types except PBX calls and when RADIUS client is enabled. With this checkbox selected, when dialing the current pattern, callers will need to pass the authentication through RADIUS server (see above).
- **RADIUS Accounting** - checkbox is present for all call types except PBX calls and when RADIUS client is enabled. With this checkbox selected, no authentication will take place, but a caller identifying CDR (call detail report) will be sent to the RADIUS server. Checkbox selection enables accounting on the RADIUS for the certain call.

If the authentication is configured based on the caller's address, callers will pass the authentication automatically; otherwise they will be required to identify themselves by a username and a password.

The **Fail Reason** drop down list indicates available failure reasons and contains different failure reasons, depending on the call type selection on the previous page. Following Fail Reasons may be available in this list:

- **Cannot Establish Connection -** failure reason is available for E1/T1calls only and indicates cases when connection cannot be established.
- **Wrong Number –** available for PBX, SIP, H323 and IP-PSTN call types and indicates cases when the dialed number is wrong.
- **Busy -** available for PBX, SIP, H323 and IP-PSTN call types and indicates cases when the dialed destination is busy.
- **Network Failure** - available for SIP, H323 and IP-PSTN call types and indicates cases when system overload, network failure or timeout expiration occurred.
- **Other -** available for SIP, H323 and IP-PSTN call types and indicates cases when authorization, negotiation, not supported or request rejected or other unknown errors occur.
- **System Failure -** available for SIP, H323 and IP-PSTN call types and indicates cases indicated in **Network Failure** and **Other** fail reasons.
- **None –** available for all call types and indicates no fail reason.
- **Any -** available for all call types and indicates any of above mentioned fail reason.

If the call cannot be established due to some of the selected Failure Reason, the local routing table will be parsed for the next matching pattern and, if found, the call will be routed to the specified destination.

The **Port ID** drop down list is present for E1/T1 call type and contains available E1/T1 trunk(s). In case the E1/T1 call type has been selected the available Timeslots (TS) should be selected on the next page.

The **Local Call Routing Wizard** - Page 3 appears if the **Fill Call Source Information** checkbox previously had been enabled on Page 1 of the **Local Routing Wizard**, and it will require information about the Inbound caller.
The **Inbound Caller Pattern** field requires the caller's address where the current route will be applied. Alphanumerics and any characters supported in the SIP username/H323 gatekeeper are allowed for this field. Wildcards are allowed here (see chapter Entering a SIP Addresses correctly). '[' , ']' , ',', '-', '{', '}' are used to define a range or a quantity of numbers. For example, 2{13-17, ww, a-c} means that the dialed number may be 213, 214, 215, 216, or 217, 2ww, 2a, 2b and 2c to match the specified pattern; in the case of 2[3,7], the dialed number may be 23 or 27 to match the specified pattern.
The **Inbound Number of Discarded Symbols** and **Inbound Prefix** text fields are hidden only when an **E1/T1** call type has been selected from Page 1 of the **Local Routing Wizard**. The **Number of Discarded Symbols (NDS)** text field requires the number of digits that should be discarded from the beginning of the **Inbound Caller Pattern**. The field should be empty if no digits need to be discarded. Only numerics are allowed for this field, otherwise an error message occurs: "Error: Number of Discarded Symbols is incorrect - digits allowed only".

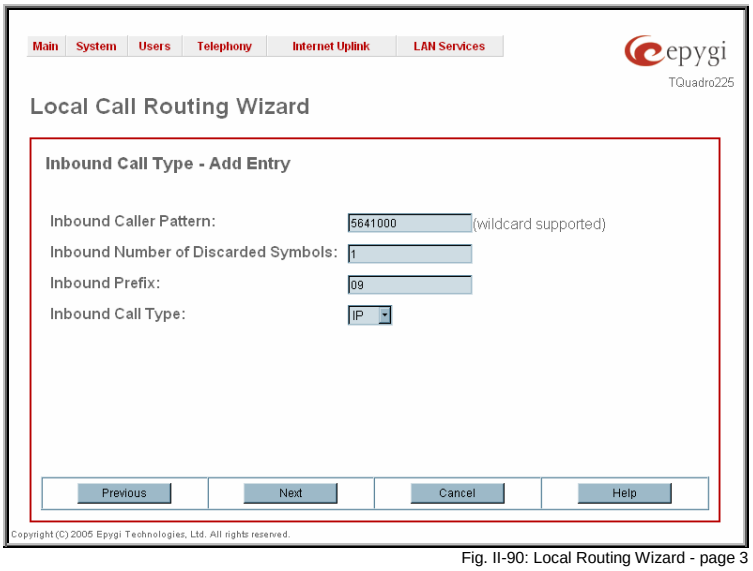


Fig. II-90: Local Routing Wizard - page 3

The **Inbound Prefix** text field requires entering the symbols (alphanumerics and any characters supported in the SIP username) that will be placed in front of the **Inbound Caller Pattern** instead of the discarded digits. (For example, if the routing pattern is 12345, the Number of Discarded Symbols is two, and the prefix digits are 909, the final phone number will be 909345.) Wildcards are allowed here (see chapter Entering a SIP Addresses correctly).
The **Inbound Call Type** drop down list gives a possibility to select the call type (PBX, SIP, H323, E1/T1) used by the inbound caller to reach the Quadro.
The **Next** button will open a **Local Call Routing Wizard** - Page 4 where different information about Inbound Caller will be required depending on the selected **Inbound Call Type**. For the **SIP** and **H323** Inbound Call Type, the **Inbound Host** text field will require one or more IP addresses or host names of SIP server/H323 gatekeeper where the caller is registered, or the caller's device in case of direct calls, separated by a space. In case of

**E1/T1** Inbound Call Types selected, **Inbound Port ID** drop down list will require to select the Trunk number, and on the next step, a list of timeslot(s) used to receive calls from the defined caller.

The **Local Call Routing Wizard** - Page 5 appears if the **Set Date / Time Period(s)** checkbox previously had been enabled on Page 1 of the **Local Vall Routing Wizard**, and it will require information about the pattern validity period(s).
Page provides selection between **Typical** and **Custom** date/time rule definition.

**Typical** selection contains a group of radio buttons that are used to select the frequency of the corresponding routing pattern to take place:

- **Daily**
- **Weekly** – the preferred weekday(s) should be selected for this option.
- **Monthly** – the calendar day should be selected for this option.
- **Annually** – the calendar day and month should be selected for this option.

In **Available Time Period** drop down lists, the time range of the pattern validation should be defined. Any time selected in this field will be considered corresponding to the Quadro's Time/Date Settings.

**Custom** selection provides a possibility to manually define the validity period(s). Use following format to insert pattern date/time rule(s):
[Month,Month-Month,...][Day-Day,Day,...][hh:mm-hh:mm,...]; ...

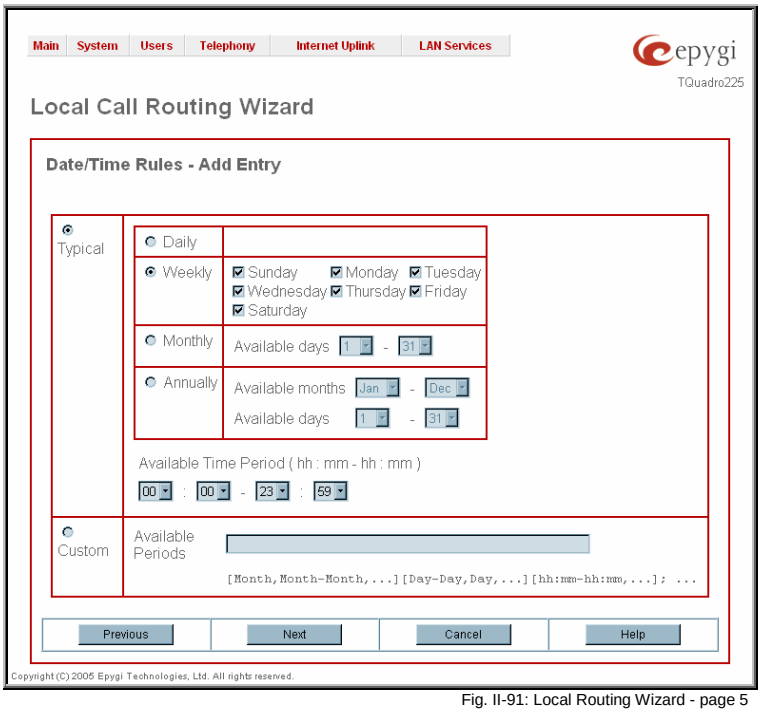


Fig. II-91: Local Routing Wizard - page 5

**Please Note:** Established patterns based on the **Emergency Codes and PSTN Access Codes Settings** in the System Configuration Wizard will be marked in bold and will be placed at the first position in the Local Routing Table. Additionally they cannot be modified and deleted from the Local Routing Table.

The **Duplicate** functional button is used to create a routing pattern with the settings of an exiting one. This is to avoid configuring a new routing entry completely by duplicating an existing entry with different settings. To use the **Duplicate** button only one record may be selected, otherwise an error will occur: "One row should be selected". The **Duplicate** button opens the **Local Call Routing Wizard** where all fields except the **Pattern** field are already filled in. **Pattern** for the new route will be required anyway.

The **Move Up/Move Down** buttons are used to move local routing patterns one level up or down within the **Local Routing** table. The consecution of the routing patterns is important when making routing calls as the **Local Routing** table is parsed from the top down and routing will take place according to the first pattern that matches the dialed number. The **Move To** button is used to move the selected entry to some other position in the Local Routing Table, which will increase or decrease the selected pattern's priority. Pressing the button will open the page where the row number should be specified, together with the position the selected entry is to be placed (before or after the defined row).

The **Local AAA Table** page allows to manage local authentication and authorization database. Callers dialing the routes which have an AAA (Authentication, Authorization, and Accounting) option enabled, will pass the authorization on **Local AAA Table** by phone number or username/password, depending on corresponding entry configuration on this page.

If the detected phone number of the caller dialing a route which has AAA option enabled, is registered in the **Local AAA Table**, caller passes authorization automatically. If the caller ID service is disabled or the caller's phone number is not registered, the caller is asked to enter registration user name and password.

The **Add** functional button opens the **Call Routing – Local AAA Table - Add Entry** page where new local AAA record can be created.

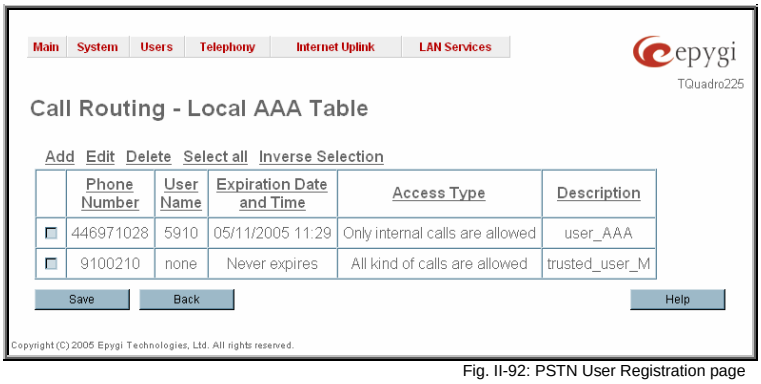


Fig. II-92: PSTN User Registration page

The **Call Routing – Local AAA Table - Add Entry** page offers the following input options:

The **Phone Number** text field requires caller's phone number. Only numeric and wildcard characters (see chapter Entering a SIP Addresses correctly) are allowed for this field. '[' , ']' , ',', '-', '{', '}' are used to define a range or a quantity of numbers. For example, 2{13-17, ww, a-c} means that the dialed number may be 213, 214, 215, 216, or 217, 2ww, 2a, 2b and 2c to match the specified phone number; in the case of 2[3,7], the dialed number may be 23 or 27 to match the specified phone number.
The **Username** text field requires the authentication user name. Only numeric values are allowed for this field, otherwise the "Incorrect Username - digits allowed only" error message occurs.
The **Password** text field requires the authentication password. Only numeric values are allowed for this field, otherwise the "Incorrect Password - digits allowed only" error message occurs.
The **Description** text field required an optional description about the calling party.
The **Expiration Date and Time** drop down lists are used to set the date and time when the registration is to expire.
The **Expires in** checkbox is used to enable the **Expiration Date and Time** feature.
The **Access Type** radio buttons allow to switch between permissions for the caller:

- **Only internal calls are allowed**: Only calls within the same Quadro are allowed.
- **All kinds of calls are allowed**: PBX, SIP, H323 and E1/T1 routing calls are allowed.

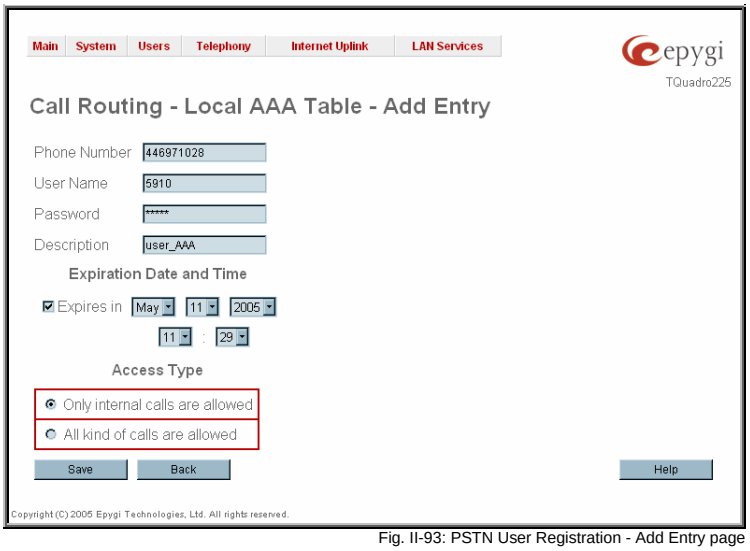


Fig. II-93: PSTN User Registration - Add Entry page

**To make a Local Routing pattern**

1. Click on the **Local Routing Table** link on the **Call Routing** page.
2. Press the **Add** button on the **Local Routing** page.
3. Specify the **Pattern** in the corresponding field.
4. Select the **Number of Discarded Symbols** and **Prefix** if required.
5. Select the **Call Type** from the drop down list.
6. Define the **Metric** or leave the default.
7. Enter a **Description** if needed.
8. Enable the **Filter on Caller / Call Type / Modify Caller ID** checkbox, if the route functionality should be limited depending on inbound caller information.
9. Enable **Set Date/Time Period(s)** checkbox, if route should be functional within certain time/date interval.
10. Press **Next**.
11. Select user or attendant extension from **Use Extension Settings** drop down on behalf of which the call will be placed.
12. Specify the **Destination Host** and **Port Number**, **Username** and **Password** if **SIP**, **H323** or **IP-PSTN** call type has been selected. Additionally select the **H323 Alias** from the same named drop down list if **H323** call type has been selected. For **IP-PSTN** call type, enable **Multiple Logons** if necessary. For **E1/T1** call type choose one or more timeslots from the **Timeslots** list. Enable **Use RTP Proxy** checkbox, if needed.
13. Choose the Authentication and Accounting method from **AAA Required** drop down list.
14. Choose a **Fail Reason** from the corresponding drop down list.
15. Press the **Next** button.
16. If **Filter on Caller / Call Type / Modify Caller ID** checkbox has been previously enabled and the call type is different from the E1/T1, fill **Inbound Caller Pattern** in the corresponding text field, choose the needed value from **Inbound Call Type** drop down list, as well as **Inbound Number of Discarded Symbols** and **Inbound Prefix** values.
17. Press the **Next** button.
18. If **SIP** or **H323** has been selected on the previous step in the **Inbound Call Type** drop down list, then **Inbound Host** should be inserted in the current page. If **E1/T1** has been selected in the **Inbound Call Type** drop down list, **E1/T1 trunk** number followed by the list of timeslots should be selected here.
19. If **Set Date/Time Period(s)** checkbox has been selected on the first page, pressing **Next** will open **Date/Time Rules** page where route validity should be defined.
15. Press the **Finish** button to establish a local route with the inserted settings.

**To create a local AAA entry**

1. Click on the **Local AAA Table** link on the **Call Routing** page.
2. Press the **Add** button on the **Local AAA Table** page.
3. Enter the desired **Phone Number** into the corresponding field on the **Add Entry** page.
4. Specify a **Username** and **Password** if necessary.
5. Use the **Expiration Date and Time** checkbox to enable the expiration timeout.
6. Select the **Expiration Date and Time** from the corresponding drop down lists.
7. Select the **Access Type**.
8. Press **Save** to apply these settings.

## VoIP Carrier Wizard

**VoIP Carrier Wizard** is used to define access codes for available VoIP Carrier account which will particularly allow to reach users over IP-PSTN providers or to call to the peers registered on the certain SIP servers by dialing simple digit combinations.

For each configured VoIP carrier, wizard creates specific IP-PSTN routing rule in the Local

Call Routing table. Additionally, a virtual extension will be automatically generated in User Management, will be registered on the defined VoIP Carrier's SIP server and on behalf of which the calls from Quadro's users towards the created VoIP Carrier will be placed.

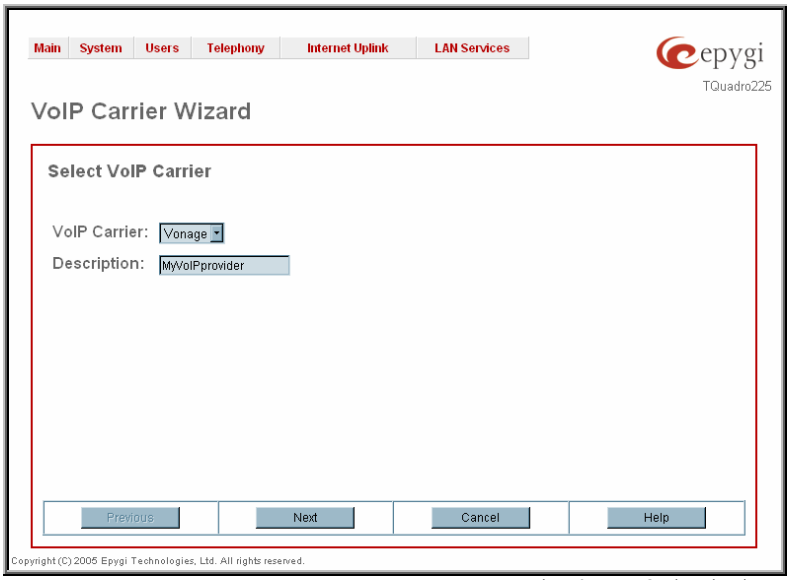
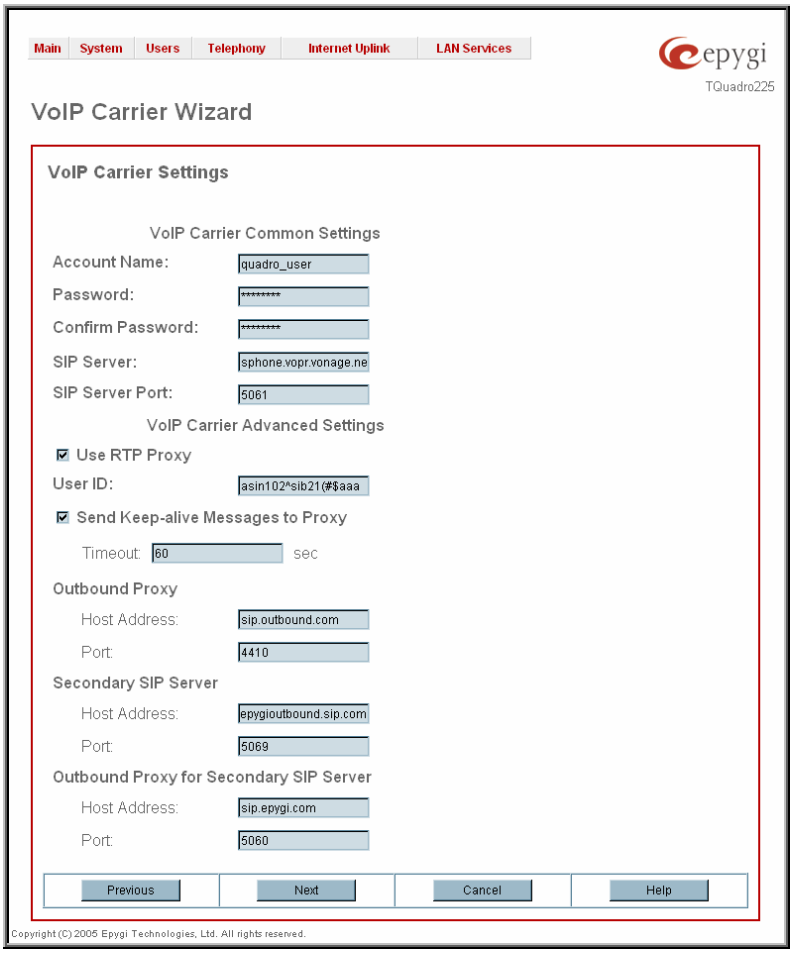



Fig. II-94: VoIP Carrier Wizard page

**VoIP Carrier Wizard – Page 1** provides a possibility to describe VoIP carrier:

When **Vonage** is selected in **VoIP Carrier** drop down list, SIP Server and Port will be already predefined in the next page. **Manual** selection allows to set up the VoIP Carrier settings manually.

**Description** field allows to insert an optional description of the VoIP Carrier.




**VoIP Carrier Wizard – Page 2** is used to define VoIP Carrier Settings. Page contains following components:

**1. VoIP Carrier Common Settings**

**Account Name** text field requires a username for authentication on the defined SIP server.

**Password** requires a password for authentication on the defined SIP server.

**Confirm Password** requires a password confirmation. If the input is not corresponding to the one in the **Extension Password** field, the error will appear: "Incorrect Password confirm".

**SIP Server** text field requires an IP address or the hostname of the SIP server destination party is registered on.

**SIP Server Port** text field requires the port number of the SIP server destination party is registered on.

**2. VoIP Carrier Advanced Settings**

**Use RTP Proxy** checkbox is applicable only when route is used for calls towards configured VoIP Carrier from peer located outside the Quadro. When this checkbox is selected, RTP streams between external users will be routed through Quadro, otherwise, when checkbox is not selected, RTP packets will be moving directly between peers.

**UserID** requires an identification parameter to reach the SIP server. It should have been provided by the SIP service provider and can be requested for some SIP servers only, for others, the field should be left empty.

**Send Keep-alive Messages to Proxy** enables the SIP registration server accessibility verification mechanism. **Timeout** indicates the timeout between two attempts of SIP registration server accessibility verification. If no reply is received from the primary SIP server within this timeout, the secondary SIP server will be contacted. When the primary SIP server recovers, SIP packets will be sent to it once again.

A group of **Host address** and **Port** text fields respectively require the host address (IP address or the host name), the port number of the **Outbound Proxy**, **Secondary SIP Server** and the **Outbound Proxy for the Secondary SIP Server**. These settings are provided by the SIP servers' providers and are used by Quadro to reach the selected SIP servers.

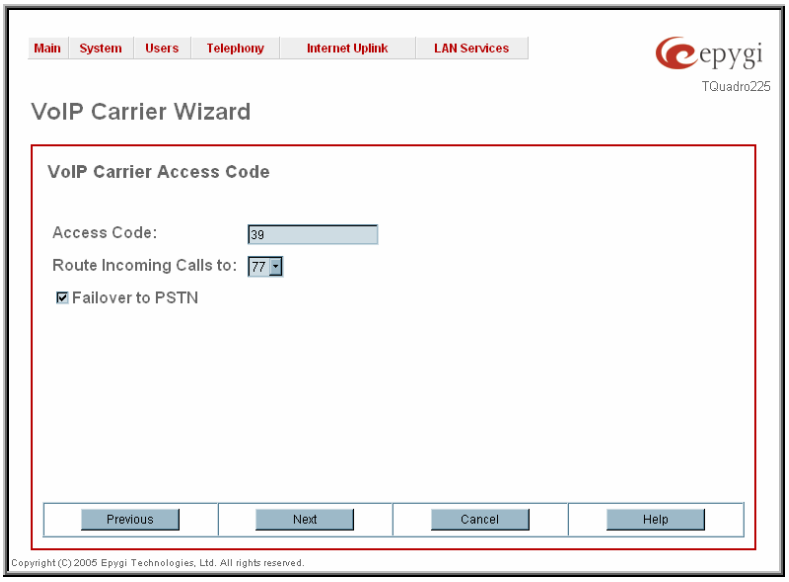
**VoIP Carrier Wizard – Page 3** contains VoIP Carrier access code selection components:

**Access Code** text field requires a digit combination by dialing which the corresponding VoIP Carrier will be reached.

**Route Incoming Calls To** drop down list allows to select an extension (or Auto Attendant) on the Quadro where incoming calls from the configured VoIP Carrier should be routed to.

**Failover to PSTN** checkbox selection will route the call to PSTN through local FXO line in case if VoIP Carrier is not available. When this checkbox is selected, an additional entry will be added to the Local Call Routing table maintaining digit transmission to local PSTN when IP call towards the configured VoIP Carrier cannot be established.

**Please Note:** Warning message will inform that the defined **Access Code** already exists in the Local Call Routing table or causes a conflict with entries already in the Local Call Routing table. In this case, when proceeding the **VoIP Carrier Wizard**, existing entry in the Local Call Routing table will be automatically overwritten by the new settings.



## RADIUS Client Settings

The **RADIUS** (Remote Authentication Dial In User Service) specifies the RADIUS protocol used for authentication and authorization, to differentiate, to secure and to account for the users. The RADIUS Server gives an extra possibility for caller from/through Quadro to pass authentication to be able to dial the specific number.

When RADIUS client is enabled on the Quadro, any caller that dials routing pattern with **Authentication&Accounting** option selected (see Local Call Routing table), will primarily pass authentication locally, through **Local AAA Table**, and if local authentication failed, will pass additional authentication on the RADIUS Server. This can be accomplished by caller's number automatic detection or a customizable login prompt, where caller is expected to enter username and password.

Transactions between the client and the RADIUS server are authenticated through the use of a shared Secret Key, which is never sent over the network. In addition, any user passwords are sent encrypted between the client and RADIUS server, to eliminate the possibility that someone snooping on an insecure network could determine a user's password. If no response from the RADIUS Server is returned after Receive Timeout expires, the request is resent a number of times, defined in the Retry Count list. The client also can forward requests to an alternate server or servers if the primary server is down or unreachable. An alternate server can be used after a number of failed tries to the primary server.

Once the RADIUS server receives the request, it determines if the sending client is valid. A request from a client that the RADIUS server does not have a shared secret must be silently discarded. If the client is valid, the RADIUS server consults a database of users to find the user whose name matches the request. The user entry in the database contains a list of requirements (username, password, etc.) that must be met to give access to the user. If all conditions are met, the user gets access to the Quadro Network.

The **RADIUS Client Settings** page contains the **Enable RADIUS Client** checkbox that enables RADIUS client on the Quadro. The other RADIUS Client settings are divided into three groups:

**1. Registration Settings**

**Primary Server** requires the IP address of the primary Radius Server.
**Secondary Server** requires the IP address of the secondary Radius Server.
**NAT Station IP** text fields require the NAT PC WAN IP address. If no NAT Station is specified here, Quadro's IP address will be sent to the RADIUS server.
**Secret Key** is used to insert the secret key between the Radius client and the server. Contact the Radius server administrator to get the secret key for your Quadro.
**Confirm Secret Key** field is used to verify the secret key. If the entered **Secret Key** does not correspond to the one in the **Confirm Secret Key** field, the error will appear: "The Secret Key does not match. Please try again".
**Retry Count** allows selecting the number of attempts before canceling the registration.
**Receive Timeout** allows selecting the timeout (in seconds) between two attempts to register.
**Encoding Type** allows selecting the encoding type (PAP or CHAP) that should be unique on both the client and the server sides for the establishment of a successful connection. Encoding type also should be requested from the Radius Server administrator.
The **Authorization Port** text field requires the port number on the RADIUS server where Quadro will send the authentication requests.
The **Accounting Port** text field requires the port number on the RADIUS server where Quadro will send the accounting messages.

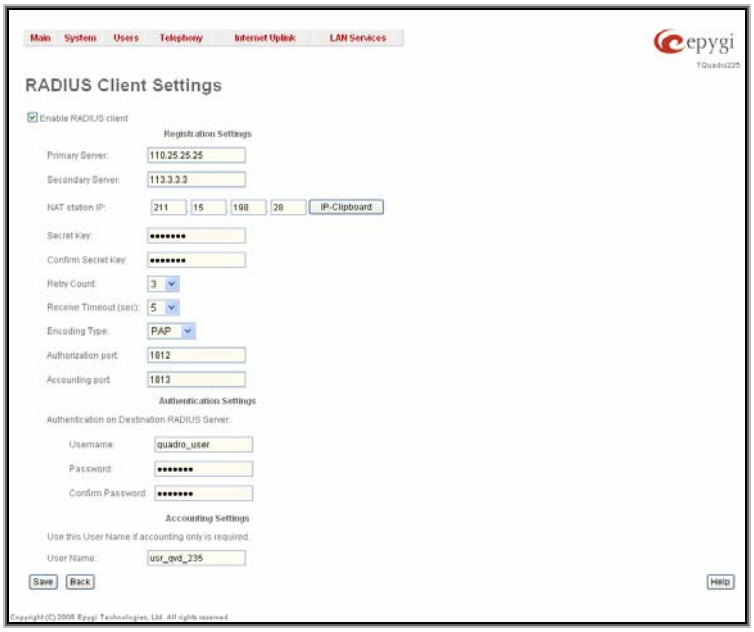



Fig. II-95: Radius Client Settings page

**2. Authentication Settings**

The **Username** and **Password** text fields require the user name and password (followed by the password confirmation) used by PSTN callers to pass the authentication on to the RADIUS Server of the destination Quadro. If these fields are left empty, the original authentication settings that PSTN users enter into the Quadro Network will be used.

**3. Accounting Settings**

The **Username** field is dedicated for accounting service only and is used to insert an identification username accounting will be performed on behalf of. When no username is specified in this field, source username will be used for accounting.

## Dial Plan Settings

The **Dial Plan Settings** page is used to adjust the dialing timeouts for the routing calls over Quadro.

This page consists of the only drop down list used to configure the dialing timeout for the Routing calls. Values selected in the lists indicate the interval between the dialed number and it being applied to the network.

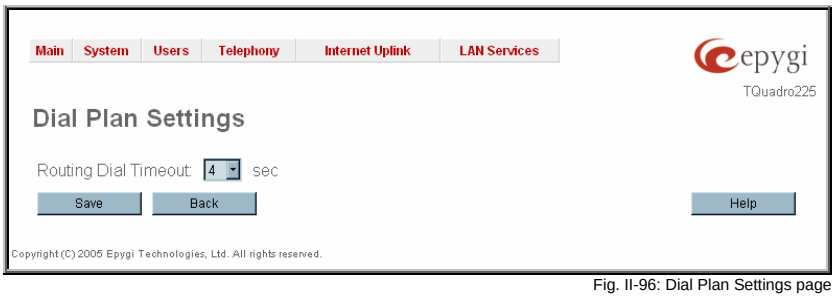



Fig. II-96: Dial Plan Settings page

## Internet Uplink Menu

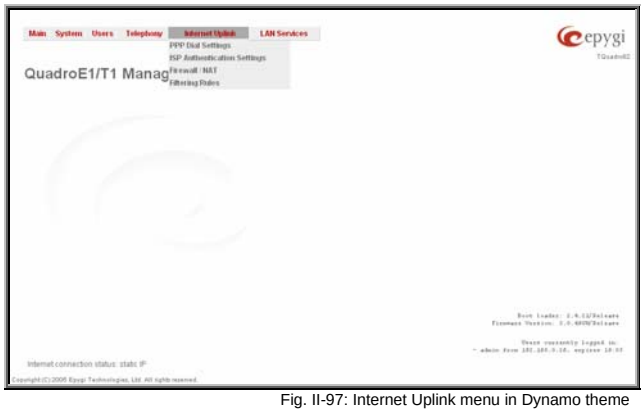



Fig. II-97: Internet Uplink menu in Dynamo theme

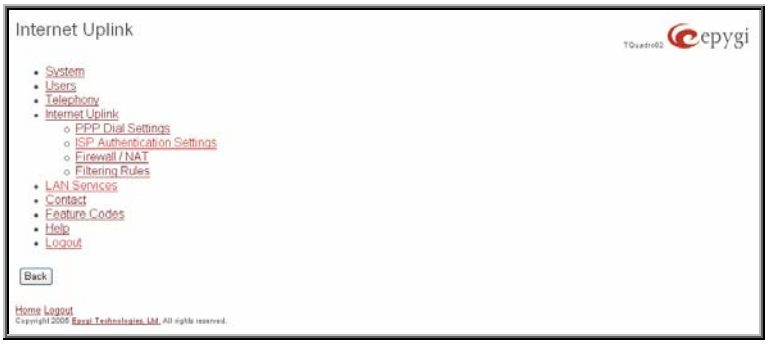



Fig. II-98: Internet Uplink menu in Plain theme

## PPP Dial Settings

The **PPP Dial Settings** page is used to establish a connection over the DSL link or any other type of uplink, to the ISP (provider party). A connection is needed to set up and to make or receive calls through PPP over Ethernet. The connection may be configured for manual setup or to be always up. Once a connection has been established between the Quadro and the provider, Quadro users will be able to make and receive calls at any time.

The **PPP Dial Settings** page offers the following components:

Advanced PPP Settings link refers to same named page where certain parts of the negotiation process during connection establishment can be adjusted.

**Dial Behavior** radio buttons:

- **Dial Manually** - if this radio button is activated, a button will be displayed in the main management window that serves to switch the Internet connection on/off. When accessing the Internet, every station of the connected LAN has to connect to Quadro first.
- **Always connected** - Quadro stays in the always connected mode. This will allow remaining always online in the network.

**Keep Connection alive** enables keeping the connection alive by sending control packets to verify the link state.

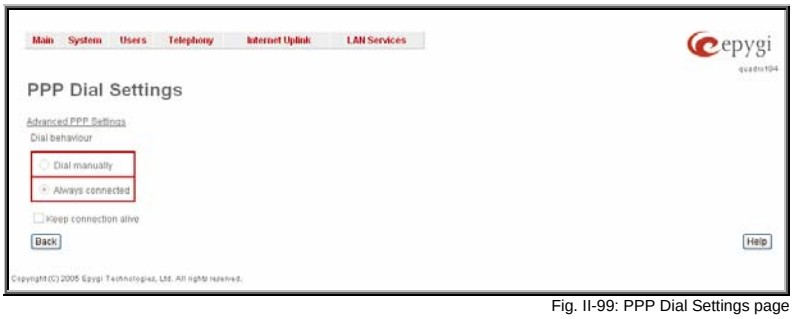



Fig. II-99: PPP Dial Settings page

## Advanced PPP Settings

The **Advanced PPP Settings** are used to enable/disable certain parts of the negotiation process during connection establishment. These settings are available only if Quadro has a PPPoE WAN interface.

**Attention**: Disabling any of the services below may cause problems when establishing a connection up to complete connection failure. The default settings should be changed only if the ISP (Internet Service Provider) requires it explicitly or if the peer system has problems with one of the services listed below. More information about these services can be found at: http://www.protocols.com/pbook/ppp.htm.

The **Advanced PPP Settings** page offers a group of checkboxes:

**Enable automatic PPP restart at** checkbox is used to select the time when PPP connection will be automatically restarted. Checkbox selection enables **LCP echo failures** text field that indicates the number of LCP echo failure packets received before the PPP connection will be considered as dead and will be restarted.

**Disable CCP (Compression Control Protocol) negotiation -** this option should only be selected if the peer system is not working properly, e.g., not accepting the requests from the PPPD (Point-to-Point Daemon) for CCP negotiation.

**Disable magic number negotiation -** with this option, PPPD cannot detect a looped-back line. This option should only be selected if the peer is not working properly.

**Disable protocol field compression negotiation in both the receive and the transmit direction -** no protocol field compression will take place.

**Disable Van Jacobson style TCP/IP header compression in both the transmit and the receive direction -** no negotiation of TCP/IP header compression will take place, the header will always be sent uncompressed.

**Disable the connection-ID compression option in Van Jacobson style TCP/IP header compression -** with this option, PPPD will not compress the connection-ID byte from Van Jacobson, nor ask the peer to do so.

**Disable the IPXCP and IPX protocols -** this option should only be selected if the peer is not working properly and cannot handle requests from PPPD for IPXCP negotiation.

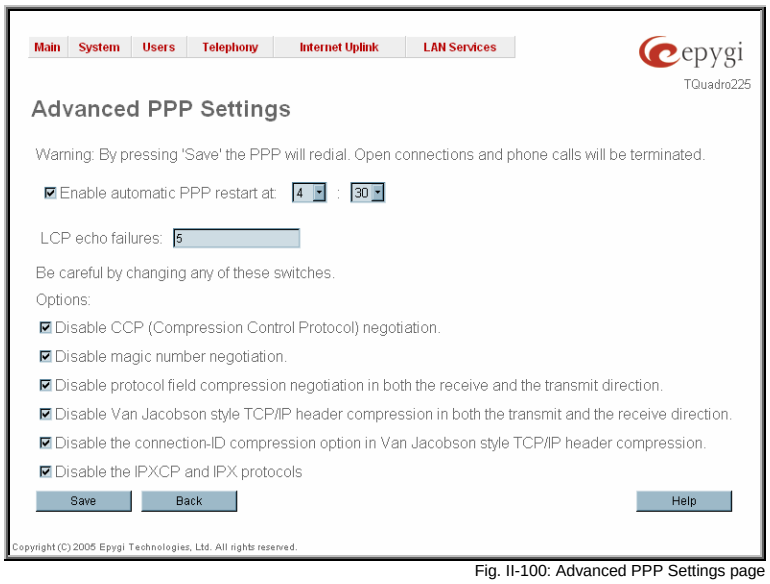

Main
System
Users
Telephony
Internet Uplink
LAN Services
epygi
TQuadro225
Advanced PPP Settings
Warning: By pressing 'Save' the PPP will redial. Open connections and phone calls will be terminated.
Enable automatic PPP restart at: 4 : 30
LCP echo failures: 5
Be careful by changing any of these switches.
Options:
Disable CCP (Compression Control Protocol) negotiation.
Disable magic number negotiation.
Disable protocol field compression negotiation in both the receive and the transmit direction.
Disable Van Jacobson style TCP/IP header compression in both the transmit and the receive direction.
Disable the connection-ID compression option in Van Jacobson style TCP/IP header compression.
Disable the IPXCP and IPX protocols
Save
Back
Help
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Fig. II-100: Advanced PPP Settings page

## ISP Authentication Settings

The **ISP authentication settings** are used to establish a connection between the Quadro and the ISP (provider party) that requires security verification. Authentication is needed by the provider party to identify a user trying to connect it.

These settings are available only if Quadro has a WAN interface different from the Ethernet uplink.

The **ISP authentication settings** page offers the following input options:

**Username** requires the user name to access the ISP server.

**User Password** requires the user password to access the ISP server.

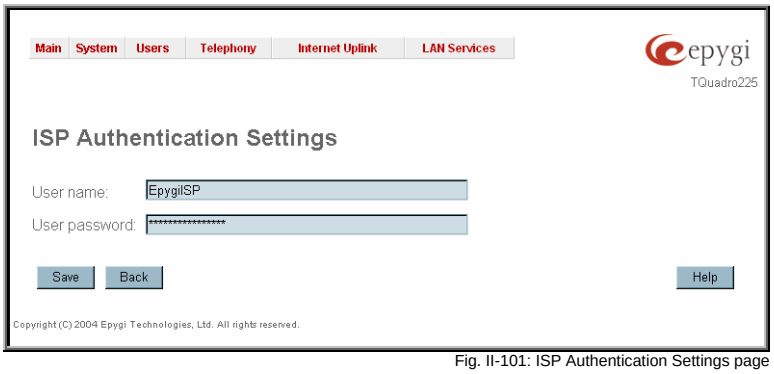


Fig. II-101: ISP Authentication Settings page

## Firewall and NAT

The **Firewall Configuration** page allows setting up a firewall, configuring the security level and enabling the NAT service of Quadro.

A **Firewall** is a security service configured by the Quadro administrator based on various criteria. The firewall allows or blocks traffic based on policies, services and/or IP addresses. The firewall has several levels of security policies (low, medium or high). The administrator may add additional service-based rules. Filtering rules will take effect only if the Firewall has been enabled and are independent from the selected firewall security level.

**NAT** (Network Address Translation) is used to allow Quadro LAN members to connect to the Internet, using Quadro's WAN IP address. The Quadro/NAT also handles forwarding incoming packets from the WAN to the PCs or devices on Quadro's LAN.

The **Firewall Configuration** page offers the following components:

The **Enable NAT** checkbox selection enables Network Address Translation.

The **Enable Firewall** checkbox selection enables the firewall security service. The firewall security level has to be selected, otherwise the firewall cannot be enabled.

The **Firewall Security** radio buttons are:

- **Low Security** - Everything that is not explicitly forbidden is allowed. This security level doesn't block anything by default. It is recommended if the device is already located behind another firewall or if every filter has been configured correctly.
- **Medium Security** - Traffic originating from the LAN side may pass and traffic from the WAN side will be blocked by default. This is the recommended security level.
- **High Security** - Everything that is not explicitly allowed will be blocked, including traffic from the LAN side.

Advanced Firewall Settings link refers to page where Quadro's privacy can be configured.

The **View Filter Rules** link opens the Filtering Rules page.

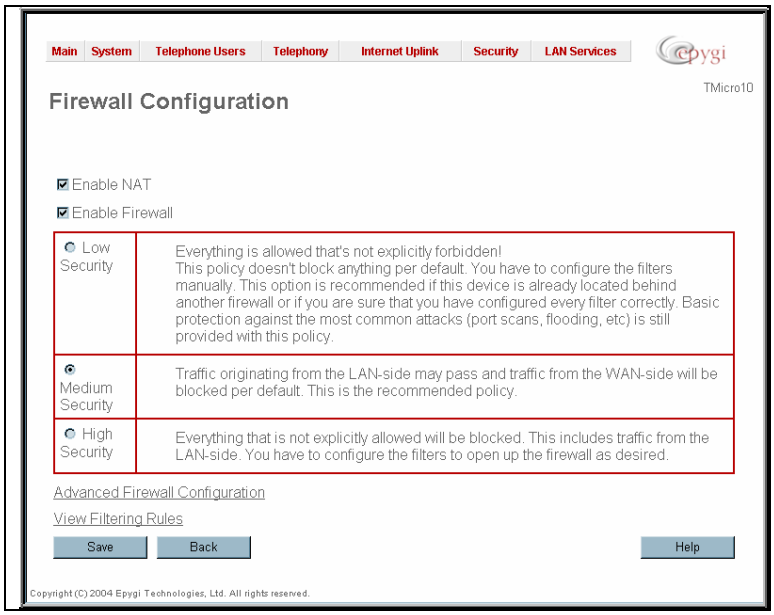
Main
System
Telephone Users
Telephony
Internet Uplink
Security
LAN Services
TMicro10
Firewall Configuration
Enable NAT
Enable Firewall
Low Security
Everything is allowed that's not explicitly forbidden!
This policy doesn't block anything per default. You have to configure the filters manually. This option is recommended if this device is already located behind another firewall or if you are sure that you have configured every filter correctly. Basic protection against the most common attacks (port scans, flooding, etc) is still provided with this policy.
Medium Security
Traffic originating from the LAN-side may pass and traffic from the WAN-side will be blocked per default. This is the recommended policy.
High Security
Everything that is not explicitly allowed will be blocked. This includes traffic from the LAN-side. You have to configure the filters to open up the firewall as desired.
Advanced Firewall Configuration
View Filtering Rules
Save
Back
Help
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Fig. II-102: Firewall and NAT Settings page

## Advanced Firewall Settings

**Advanced Firewall Settings** are used to deny Ping and Portscanning operations addressed toward the device. With these features enabled, Quadro will answer with inscrutable messages to the Ping and Portscanning operations.

**Please Note:** Operations are available only when Firewall is enabled from the **Firewall and NAT** page.

The page offers the following components:

The **Ping Stealth** checkbox selection prohibits a Ping operation toward Quadro from its WAN.

The **Fool Portscanner** checkbox selection prohibits Quadro portscanning from its WAN. As a reply to a Portscanning operation, "network unreachable" or "host unreachable" feedback messages will be sent.

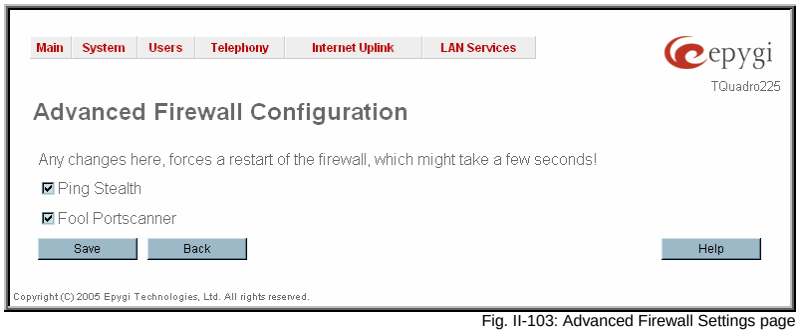


Fig. II-103: Advanced Firewall Settings page

## Filtering Rules

The **Filtering Rules** page allows the configuration of filters for the incoming and outgoing traffic.

To prevent misconfiguration, only one rule per service is allowed. The user may use IP groups to include several IP addresses for this rule. As the filtering rules specify the operation mode of the firewall, they only take effect if the firewall has been enabled (additionally NAT should be enabled to use the **Port Forwarding** function in the **Incoming Traffic / Port Forwarding** filtering rules). The filtering rules are independent from the security level, so they will work if enabled, no matter what security level has been selected.

**Please Note:** Applying firewall rules will just prevent the establishment of new connections that violate the rules. Applying rules does not kill existing connections that violate the rule.

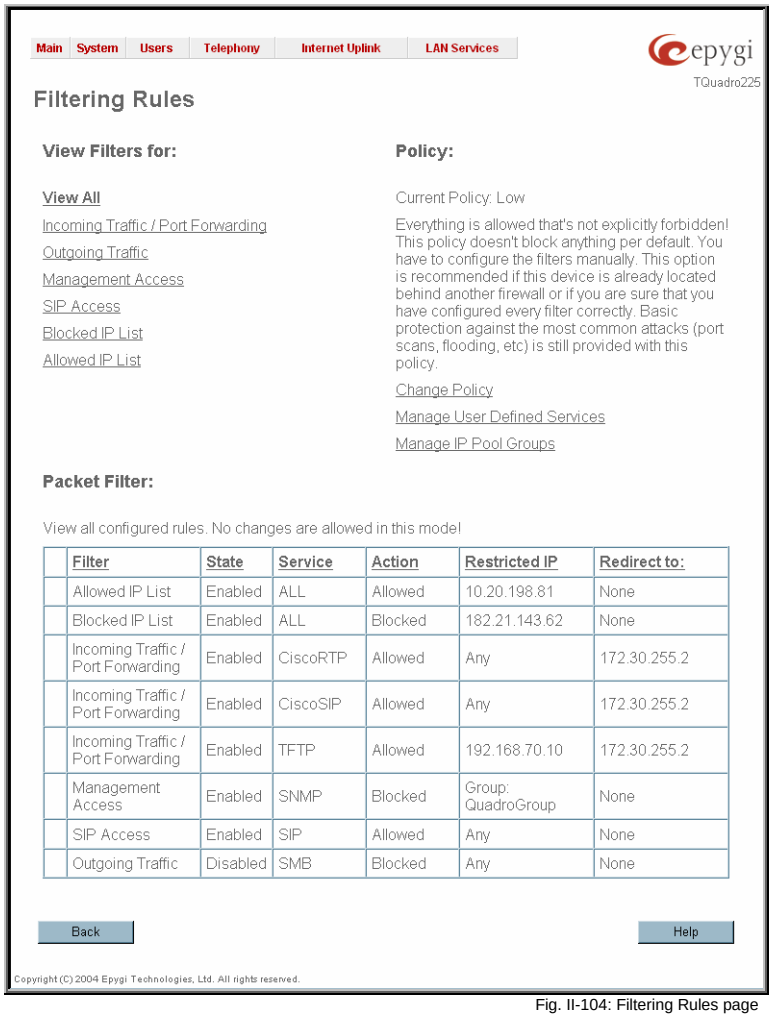
Main
System
Users
Telephony
Internet Uplink
LAN Services
epygi
TQuadro225
Filtering Rules
View Filters for:
View All
Incoming Traffic / Port Forwarding
Outgoing Traffic
Management Access
SIP Access
Blocked IP List
Allowed IP List
Policy:
Current Policy: Low
Everything is allowed that's not explicitly forbidden! This policy doesn't block anything per default. You have to configure the filters manually. This option is recommended if this device is already located behind another firewall or if you are sure that you have configured every filter correctly. Basic protection against the most common attacks (port scans, flooding, etc) is still provided with this policy.
Change Policy
Manage User Defined Services
Manage IP Pool Groups
Packet Filter:
View all configured rules. No changes are allowed in this mode!
Filter | State | Service | Action | Restricted IP | Redirect to:
Allowed IP List | Enabled | ALL | Allowed | 10.20.198.81 | None
Blocked IP List | Enabled | ALL | Blocked | 182.21.143.62 | None
Incoming Traffic / Port Forwarding | Enabled | CiscoRTP | Allowed | Any | 172.30.255.2
Incoming Traffic / Port Forwarding | Enabled | CiscoSIP | Allowed | Any | 172.30.255.2
Incoming Traffic / Port Forwarding | Enabled | TFTP | Allowed | 192.168.70.10 | 172.30.255.2
Management Access | Enabled | SNMP | Blocked | Group: QuadroGroup | None
SIP Access | Enabled | SIP | Allowed | Any | None
Outgoing Traffic | Disabled | SMB | Blocked | Any | None
Back
Help
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Fig. II-104: Filtering Rules page

**View All** displays all configured filters specified by their **State** (enabled or disabled), the selected **Service**, the set **Action** (allowed or blocked), the IP addresses the filters apply to (if **Restricted**) and the destination of port forwarding (**Redirect to**, in case of **Incoming Traffic/Port Forwarding**). As it is read-only, no modifications are allowed and no functional buttons are available.

The **Incoming Traffic/Port Forwarding** filter is for incoming traffic. The rules here allow or deny systems on the Internet to reach the services of Quadro's LAN. NAT service should be enabled on the Quadro to provide the possibility of **Port Forwarding** in the **Incoming Traffic/Port Forwarding** filtering rules. The **Port Forwarding** function will be unavailable if NAT is disabled on the Quadro.

The **Outgoing Traffic** filter is for outgoing traffic. The rules here allow or deny Quadro's LAN users to reach external services.

**Management Access** is used to enable management access to the Quadro from the Internet. A host on the Internet can be allowed to reach the Quadro.

**SIP Access** is to allow or deny the SIP access to or from the particular SIP servers, SIP hosts or a group of them. The **SIP Access** filtering rule may prevent or allow incoming or outgoing SIP calls to or from specified SIP server(s) or host(s).

When **Blocked IP List** is used, traffic from specific hosts may be blocked, no matter what services are opened in the other filters. NO traffic will be allowed to the specified hosts. The **Blocked IP List** service has a higher priority if the same host is also listed in the **Allowed IP List** table.

**Allowed IP List** allows trusted hosts to reach your network and vice versa. It is an exception to other rules and only all services may be allowed for a single host.

The **Filtering Rules** page provides several links. Each link opens its specific parameters on the same page. Only **Change Policy** (see chapter Firewall and NAT), **Manage user Defined Services** (see chapter Service Pool) and **Manage IP Pool Groups** (see chapter IP Pool) are leading to separate pages. The **Filtering Rules** page also includes the currently selected firewall security (**Policy**) level and its description.

The table displayed on the bottom of the page shows the filters selected above, specified by their **State** (enabled or disabled), the selected **Service**, the set **Action** (allowed or blocked), the IP addresses the filters apply to (if **Restricted**) and the destination of port forwarding (**Redirect to**, in case of **Incoming Traffic/Port Forwarding**). With the exception of View All, the table offers the following functional buttons:

- **Enable** is used to enable the rule. If no records are selected the "No record(s) selected" error occurs.
- **Disable** is used to disable the rule. If no records are selected the "No record(s) selected" error occurs.
- **Add** opens a filter specific page where new rules may be defined by a **Service**, an **Action,** a **Restriction** to certain IP address(es) or IP groups, and if adding a rule for **Incoming Traffic/Port Forwarding**, the destination IP address for **Forwarding:**

For example, the page to add a rule for **Incoming Traffic/Port Forwarding** offers the following input options:

**Service** includes a list of possible services to be configured. All user defined services also will be displayed in this list.

**Action** includes possible actions to setup the rule.

**Forward to IP** requires the destination IP address where traffic should be transferred to, if it comes from the restricted host. The IP address defined in this field will be ignored for blocked action of the **Incoming Traffic/Port Forwarding** rule.

**Note:** It is not allowed to forward incoming packets when NAT service is disabled on the Quadro.

**Port Translation** text field is available for "Allowed" action only and optionally requires the port number that will stand instead of original port number when incoming packet is being forwarded. If this field is left empty, original port number will be used upon forwarding the packet.

**Restriction** radio buttons:

- Selecting **Any** blocks or allows all host IP addresses. This selection is not present for the **Management Access**, **Blocked** and **Allowed IP List** rules.
- Selecting **Single IP** will require the IP address of the allowed or blocked host.
- Selecting **IP/Mask** will require the subnet to be allowed or blocked, specified by an IP address and the Maskbits. **Maskbit** examples:
  255.0.0.0= /8,
  255.255.0.0 = /16,
  255.255.255.0 = /24,
  255.255.255.255= /32
- **Group** indicates the user defined groups that include IP addresses that ought to be allowed or blocked.

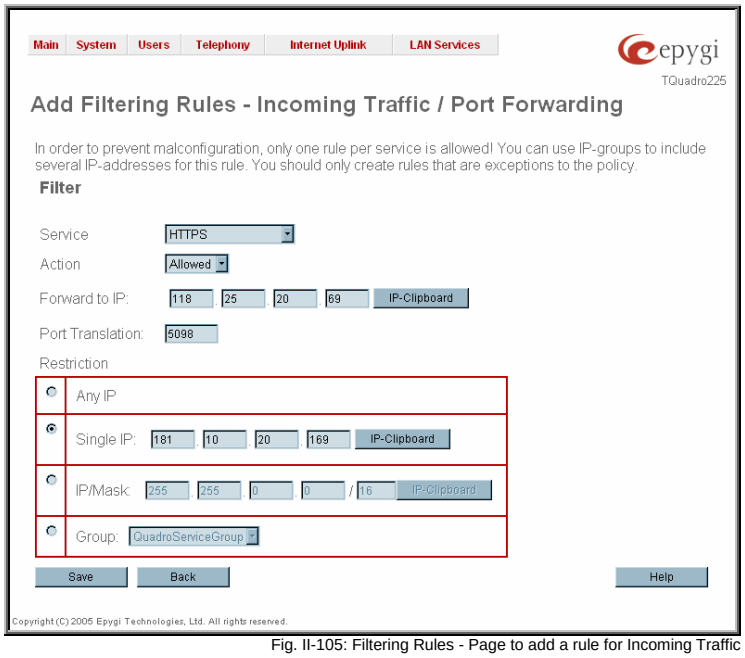


Fig. II-105: Filtering Rules - Page to add a rule for Incoming Traffic

**To Add a Filtering Rule**

1. Select the **Filter** link (Incoming Traffic/Port Forwarding, Outgoing Traffic, Management Access, SIP Access, Blocked IP List or Allowed IP List) to add a rule for it. The corresponding **Filter** table will appear in the same window.
2. Click **Add** on the **Filtering Rules** page. A page where a new rule may be added will appear in the browser window. The page will be named corresponding to the selected filter.
3. Select a service name from the **Service** list to configure a rule for it. If the list has a default value, leave it as is.
4. Select an action from the **Action** list that is used in the rule. If the list has a default value, leave it as is.
5. Enter the IP address in the **Forward to IP** field if an **Incoming Traffic Rule** is to be added.
6. Choose the restriction type by selecting **Any**, **SingleIP** or **IP/Mask** and enter the required information in the text fields or select a group.
7. To add a rule with these parameters press **Save**.

**To Delete Filtering Rules**

1. Select the **Filter** link to delete a rule from its table. The appropriate **Filter** table will appear in the same window.
2. Check one or more checkboxes of the corresponding rules that ought to be deleted from the rules table. Press **Select all** if all rules ought to be deleted.
3. Press the **Delete** button on the **Filtering Rules** page.
4. Confirm the deletion with **Yes**, or cancel it with **No**.

## Service Pool

The **Service Pool** table is a list of all created services and their parameters. It is used to add new services with the appropriate settings (protocol type and port range). New services can be used to add a restriction or permission by defining a new filtering rule:

**Add** opens the **Add New Service** page where new services may be added.

**Edit** opens the **Edit Service** page where the service parameters (except for the service name) can be modified. This page includes the same components as the **Add New Service** page. To operate with **Edit** only one record may be selected, otherwise an error will occur: “One row must be selected”.

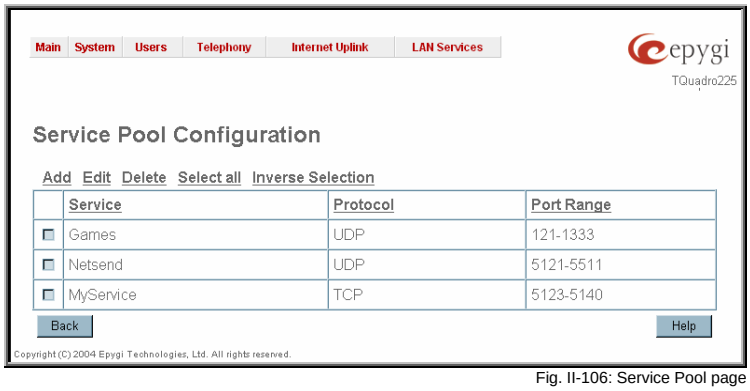



Fig. II-106: Service Pool page

The **Add** page is used to add new services and includes the following text fields and buttons:

**Service Name** requires a name for the service that ought to be added.

**Protocol** includes a list of possible protocols to be selected.

**Port Range** requires a port range for the defined service.

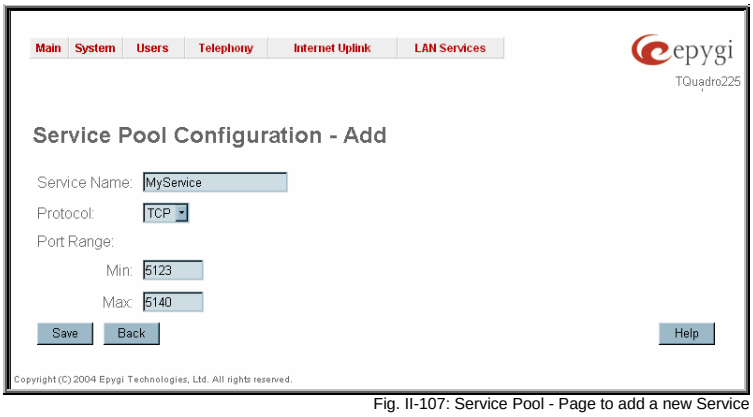



Fig. II-107: Service Pool - Page to add a new Service

**To Add a new Service**

1. Select the **Manage User Defined Services** link on the **Filtering Rules** page.
2. Click on the **Add** button on the **Service Pool Configuration** page. A page where a new service may be added will appear in the browser window.
3. Define a service name in the **Service Name** text field.
4. Select the protocol type for the service from the **Protocol** drop down list.
5. Enter the port range in the **Port Range** text fields or leave one of them empty to define a particular port for the service.
6. To add a service with these parameters click on **Save**.

**To Delete a Service**

1. Select the **Manage User Defined Services** link. The **Service Pool Configuration** page appears with the table of services (if any).
2. Check one or more checkboxes of the corresponding services that ought to be deleted from the **Service Pool** table. Press **Select all** if all services ought to be deleted.
3. Click on the **Delete** button on the **Service Pool Configuration** page.
4. Confirm the deletion with **Yes**, or cancel it with **No**.

## IP Pool

The **Manage IP Pool Groups** link opens the **IP Pool Configuration** page.

The **IP Pool** table is the list of all added groups and the members assigned to these groups. If a group is empty, **EMPTY** will be indicated in the **Members** column. If hidden, group members will still remain active but **HIDDEN** will be displayed in the **Members** column.

The **IP Pool Configuration** is used to add groups of IP addresses that have the same restriction criteria. Whenever adding a new filtering rule, groups may be used instead of several IP addresses. **IP Pool Configuration** offers the following components:

Fig. II-108: IP Pool Configuration page

**View** makes hidden groups visible.

**Hide** makes group members hidden and adds the **HIDDEN** comment in the member column.

**Add** opens the **Add Group** page where a new group may be added. This page consists of the **Group Name** text field (requiring the group name) and the **Group Description** text field (requiring the optional group description), as well as standard **Save** and **Back** buttons to apply or abort changes.

**Edit** opens the **Edit Group** page where the service parameters can be modified. It provides the same components as the **Add Group** page. To operate with **Edit**, only one record may be selected, otherwise an error will occur: "One row must be selected".

**Please Note:** Changing a group name will also change the references to this group, including groups where this group is a member of, and all affected filter rules (enabled and disabled ones, in all chains).

Clicking on the **Group** name will display an **IP Pool Group Configuration** page with the **Members** list for the current group.

Fig. II-109: IP Pool configuration – Add Group page

The **IP Pool Group Configuration** page displays a list of all the added member IP addresses for the selected group. It offers the following components:

**Current Group** provides read-only information about the current group name the members are listed for.

**Add** opens the **Add Member** page where a new member may be added.

**Edit** opens the **Edit Members** page where the service parameters can be modified. This page includes the same components as the **Add Member** page. To operate with **Edit**, only one record may be selected, otherwise an error will occur: "One row must be selected".

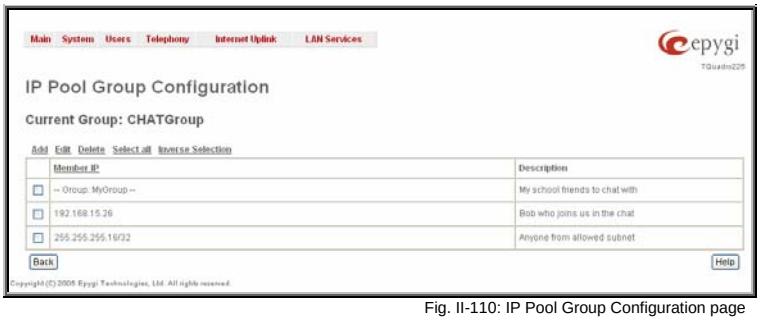



Fig. II-110: IP Pool Group Configuration page

The **Add Members** page provides the following radio buttons:

**IPaddress** requires the member IP address that is to be added to the group.

**IP Subnet** requires the subnet specified by the IP address and the Maskbits. See above for more information about Maskbits.

The **User-defined Group** includes previously added groups that also may be added as a member to another group.

**Member description** text fields can be used to enter an optional description of the member.

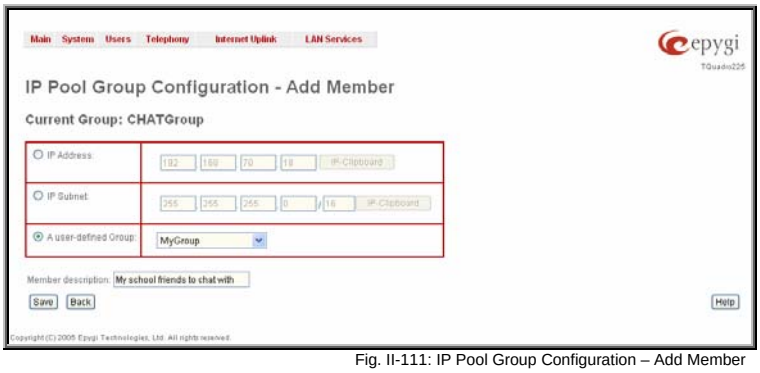



Fig. II-111: IP Pool Group Configuration – Add Member

**To Add a new Group with Members**

1. Select the **Manage IP Pool Groups** link on the **Filtering Rules** page.
2. Click on the **Add** button on the **IP Pool Configuration** page. A page where a new group may be added will appear in the browser window.
3. Define a group name in the **Group Name** text field and fill in the **Group Description**, if needed.
4. To add a group with the given parameters press **Save**.
5. Open the **IP Pool Group Configuration** page by clicking on the group name.
6. Select the **Add** button on the **IP Pool Group Configuration** page. A page opens where new members may be added to the group.
7. Enter an IP address for the member in the **IP Address** text fields, select a IP subnet or IP group from the **User defined Group** drop down list to assign it to the currently selected group.
8. Enter a **Member Description** in the corresponding text field, if needed.
9. To add a member with these parameters to the selected group press **Save**.

**To Delete a Member**

1. Select the **Manage IP Pool Groups** link. The **IP Pool Configuration** page appears with the table of groups (if any).
2. Click on the desired members that ought to be deleted. The **IP Pool Group Configuration** list appears.
3. Check one or more checkboxes of the corresponding members that ought to be deleted from the **Members** table. Press **Select all** if all members ought to be deleted.
4. Press the **Delete** button on the **IP Pool Group Configuration** page.
5. Confirm the deletion with **Yes** or quit with **No**.

**To Delete a Group**

1. Select the **Manage IP Pool Groups** link. The **IP Pool Configuration** page appears with the table of groups (if any).
2. Check the one or more checkboxes of the corresponding groups that ought to be deleted from the groups table. Press **Select all** if all groups ought to be deleted.
3. Press the **Delete** button on the **IP Pool Configuration** page.
4. Confirm the deletion with **Yes** or quit with **No**.

## LAN Services Menu

Fig. II-112: LAN Services menu in Dynamo theme

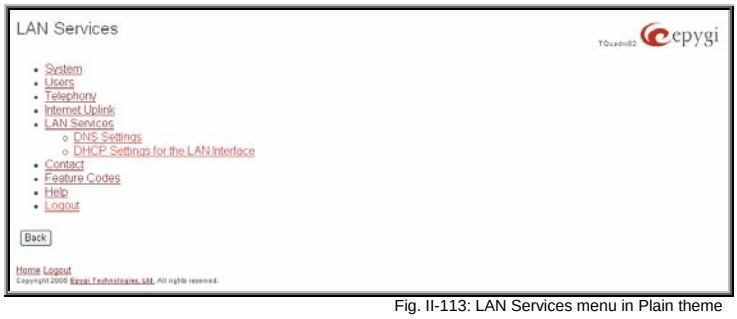



Fig. II-113: LAN Services menu in Plain theme

## DNS Settings

The **DNS Settings** page gives the possibility to setup a name server for the Quadro. It offers the following components:

**NameserverAssignment** radio buttons:

- **Dynamically by provider** selection automatically configures the assignment of the name server address from the provider party.
- **Fixed Nameserver address** is a manually selected name server. The **Nameserver** text field requires the IP address of an external name server. The **Alternative Nameserver** text field requires the IP address of the secondary name server. The **Alternative Nameserver** is used if the main name server cannot be accessed.

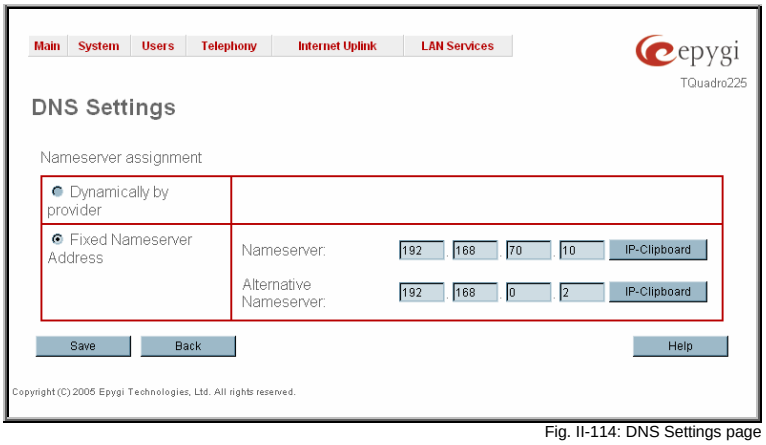

Main System Users Telephony Internet Uplink LAN Services
epygi
TQuadro225
DNS Settings
Nameserver assignment
Dynamically by provider
Fixed Nameserver Address
Nameserver: 192 168 70 10 IP-Clipboard
Alternative Nameserver: 192 168 0 2 IP-Clipboard
Save Back Help
Copyright (C) 2005 Epygi Technologies, Ltd. All rights reserved.

Fig. II-114: DNS Settings page

## DHCP Settings for the LAN Interface

The **DHCP Settings** page gives the possibility to enable a DHCP server and control the Quadro user's LAN settings. Thus Quadro LAN users will be provided automatically with the following settings using the configured parameters:

- IP addresses
- NTP (corresponds to the Quadro's IP address)
- WINS server
- Nameserver (corresponds to the Quadro's IP address)
- Domain name

The **DHCP Settings** page offers the following input options:

**Enable DHCP Server** activates the DHCP server on Quadro.

**IP Address Range** defines a range of IP addresses that will be assigned to the Quadro LAN users. The IP range must be at least six, otherwise the "Address Range too small" error will prevent saving. The "Address Range too large" error occurs if the IP range is greater than 254.

**WINS Server** defines a WINS server IP address for the Quadro LAN users.

**View DHCP Leases** leads to the page where the DHCP leased LAN IP addresses are listed.

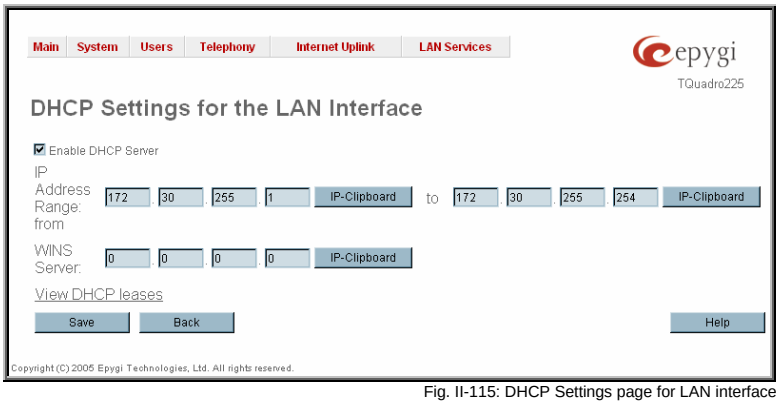

Main System Users Telephony Internet Uplink LAN Services
epygi
TQuadro225
DHCP Settings for the LAN Interface
Enable DHCP Server
IP Address Range: from 172 30 255 1 IP-Clipboard to 172 30 255 254 IP-Clipboard
WINS Server: 0 0 0 0 IP-Clipboard
View DHCP leases
Save Back Help
Copyright (C) 2005 Epygi Technologies, Ltd. All rights reserved.

Fig. II-115: DHCP Settings page for LAN interface

The **DHCP Leased IP Addresses** page includes a list of the leased host addresses that are part of the Quadro's LAN. For these hosts, Quadro acts as a server supplying them with a unique IP address. It displays a read-only table describing all the leased IP hosts and their parameters. The table contains the following columns:

**IP address** - host IP address, assigned by Quadro.

**MAC address** - host MAC address, provided by the host itself.

**Lease Start** - date and time when the leased IP address has been activated.

**Lease End** - date and time when the leased IP address has been or will be deactivated.

**Hostname** - hostname, provided by the host itself.

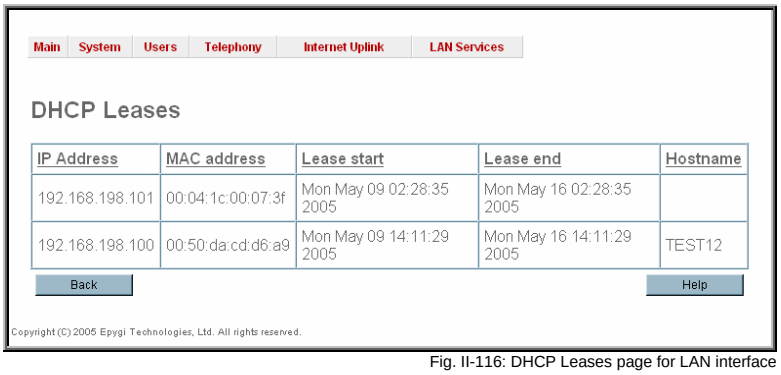



Fig. II-116: DHCP Leases page for LAN interface

## Registration Form

The **Registration Form** page appears when administrating an unregistered Quadro, and has been established for customer support purposes. The page requires customer registration at the Epygi Technical Support Center. It provides several links offering registration options:

**Register now** leads to the Epygi Technical Support System Registration page and requires customer's information to submit the Quadro registration form.

**Remind me later** hides the registration notification until the next administrating the Quadro through System Configuration Wizard or Internet Configuration Wizard.

**Don't remind me more** hides the registration notification forever.

Main
System
Users
Telephony
Internet Uplink
LAN Services
epygi
TQuadro225
Register Your Device In Technical Support Center
Register now (If you cannot reach the registration site because of connectivity problems, please open the registration page later, manually.)
Remind me later
Don't remind me more
Copyright (C) 2004 Epygi Technologies, Ltd. All rights reserved.

Fig. II-117: Device Registration page

## Logout

This option is used to close the session between the user PC and Quadro and to leave the Quadro Web Management or to enter the management with another login. By selecting the **Logout** button, the startup page will be displayed and the user needs to login again.

# QuadroE1/T1's Feature Codes

This chapter describes Quadro's call codes enabling the user to navigate through Quadro's services with the help of a phone handset. These services are **Establishing a Call** and **PBX Services**.

## Establishing a call

To make a call, dial the **Routing Number**.

**Routing Numbers** and available routs to, from and through Quadro are listed in the **Local Routing Table**, which is configured and managed by Quadro's Administrator. To get information about dialing rules, please turn to administrator.

**Please Note:** You may accelerate establishing a connection by a pound (#) sign dialed at the end of the number.

## Using Quadro's PBX Services

**PBX Services accessible at the dial tone**, characterized by beginning with the key *:

| | |
|---|---|
| **Administrator Login**<br>Allows to modify the auto attendant (AA) greeting. | *75 |

## Administrator Login

At the moment, the administrator login allows only the modification of the auto attendant (AA) messages:

After dialing *75, use key 1 to enter the auto attendant regular greeting menu and use key 2 to enter the auto attendant routing greeting menu. The key combinations beside are available to modify the auto attendant greetings.

| *75 Administrator's Login | |
|---|---|
| 1 Auto Attendant Welcome Message | 2 Auto Attendant Routing Welcome Message |
| 1 Listen to Current AA Welcome Message | 1 Listen to Current AA Routing Welcome Message |
| 2 Record a New AA Welcome Message | 2 Record a New AA Routing Welcome Message |
| 3 Restore Default AA Welcome Message | 3 Restore Default AA Routing Welcome Message |
| # Stop Recording or Playback | |
| *0 Administrator's Logout | |

# QuadroE1/T1's Auto Attendant Services

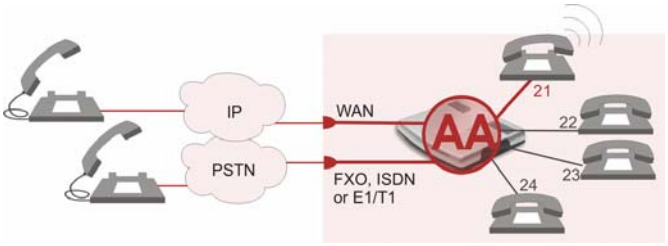
**Quadro's Auto Attendant** is addressed to provide remote access to the Quadro voice connectivity services. Specifically it supports remote connection to Quadro extensions, their mailboxes and making pass-through calls to other destinations. Remote access to the Quadro auto attendant is possible through IP and PSTN calls.

**Quadro's Auto Attendant** can be accessed locally, remotely from the IP network (by dialing Auto Attendant's SIP address) and from the PSTN network (by dialing Quadro's PSTN number) if the calls addressed to the Quadro's PSTN number are routed to the Auto Attendant.

**Attention:** If the Auto Attendant authentication attempts have been failed for the five times, Quadro's Auto Attendant will become unavailable for the next 5 minutes.

The automated attendant services are divided into 2 feature groups: **Connection Service** is supported by the voice messages help which helps caller to navigate within area using the handset buttons. **Call Relay** service is available using the appropriate call code, but are not supported by voice messages. Thus, they are hidden for external callers.

**Connection Service** provides access to all extensions of the Quadro device without restrictions: All Quadro extensions may call each other dialing the extension number. And all external callers (using PSTN or IP calling) can reach every Quadro extension dialing Quadro's phone number and using the Auto Attendant's voice menu to be connected to the desired extension by entering the extension number.




**Call Relay**

As the Quadro Auto Attendant is registered at Epygi's SIP server by default, it may be used as a kind of private switching center, if the Auto Attendant is routed to the particular telephone line (FXO, ISDN or E1/T1) as a "default user". Then it allows e.g. establishing cost-saving long-distance calls: Via PSTN to the Quadro Auto Attendant (e.g. USA headquarters), via IP to the remote Quadro Auto Attendant (e.g. Office Asia) and via PSTN to the desired destination (see call codes below).

Access to **Call Relay** needs authorization.

## Call Codes Available in Auto Attendant

For external IP calls addressed to the Auto Attendant or incoming calls from mainline routed to the Auto Attendant or local by dialing the 2-digit attendant extension, following key combinations are available to access and manipulate within Auto Attendant services:

| Incoming call to Auto Attendant Services or dial locally | Keys |
|---|---|
| **Extensions Menu** - establishing a connection to an extension on the called Quadro | - (already in) |
| **Call Relay Menu** - mainly for external calls (IP/FXO or IP/ISDN), local calls are allowed, too.<br>Service allows to avoid hanging up and redo the entire dialing, if Quadro detects an error in the dialed number or the user decides to cancel the call and start a new one: Entering the combination * * the call will be interrupted and the user will get an invitation to make a new one. This is applicable during dialing, after the ring tone has started, and after the call has been established.<br>**Attention:** This feature is available when accessing the auto attendant from the PSTN line for IP or local calls and if calling to PSTN through the Auto Attendant. It is not available, if you have to go from the first auto attendant to a second one to reach the called party. | * 2 |
| **Quits** the Auto Attendant and starts a dial tone | Flash 4 |

# Appendix: System Default Settings

| Issue | System Default Value | Comments |
|---|---|---|
| Admin Settings | Login name -admin<br>Password - 19 | |
| Quadro Hostname | quadro | |
| LAN IP Address | 172.30.0.1 | Subnet Mask - 255.255.0.0 |
| DHCP Server | Enabled | IP Range - 172.30.0.100-172.30.0.254<br>WINS - 0.0.0.0 |
| Regional Settings | Locale - US<br>TimerZone - US/Central<br>Theme - Dynamo | |
| Time/Date Settings | NTP Server and Client - Enabled<br>Predefined NTP Server - npi1.epygi.com | Polling interval - 6 |
| WAN Interface Protocol | Ethernet | |
| WAN Interface Bandwidth | Upstream – 10000<br>Downstream – 10000<br>Min Data Rate – 0 | |
| WAN IP | Automatically through DHCP | |
| Mac Address | Assigned by device | MTU - 1500 Bytes |
| DNS Server | Dynamically | |
| Mail Settings | Disabled | |
| Firewall | Enabled, Medium level | Ping Stealth - enabled<br>Fool Portscanner - disabled |
| NAT | Enabled | |
| Filtering Rules | Outgoing Traffic - MS File Sharing (Blocked for all)<br>SIP Access (Allowed for all) | No user defined services and IP pool groups |
| Event Settings | Display notification for all | |
| Call Statistics | Enabled | 100 entries for all type of calls |
| SIP Settings | UDP and TCP Port – 5060<br>Session Timer – disabled | DNS Server for SIP – default<br>SIP timers – RFC 3261 |
| H.323 Settings | UDP port – 1719<br>TCP Min port – 1720<br>TCP Max port – 1752<br>Fast connect – enabled<br>Tunneling - disabled | TCP connect timer – disabled<br>Setup timeout – 4 seconds |
| RTP Settings | RTP/RTCP port range for FXS lines - 6000-6049<br>G276 Standard - ITU-T specification<br>Telephone Event Draft Support - enabled<br>RTCP Support - disabled | Properties for all Codecs except G723 and iLBC :<br>Packetization -20ms<br>Silence Suppression -yes<br>G723 and iLBC properties:<br>Packetization - 30ms<br>Silence Suppression - yes |
| NAT Traversal Settings | NAT Traversal for SIP – enabled<br>NAT Traversal for H323 – disabled<br>SIP, H323 and RTP Parameters - Use STUN<br>SIP TCP Port - 5060 | STUN Parameters:<br>STUN Server - stun.epygi.com<br>Port - 3478<br>Polling Interval: 1 hour<br>Keep-alive interval: 120 seconds<br>NAT IP checking interval: 300 seconds<br>No entries in NAT Exclusion table |
| Line Settings | CallerID- Standard 2 FSK for all lines<br>Ringer type: Type A<br>Busy Tone indications: disabled<br>Off-hook caller ID: disabled | Line attached to 11 extension.<br>FXS Lines Loopback Settings – Loopback is disabled, Loopback timeout is 30. |
| E1/T1 Settings | Trunk0 exists<br>Trunk mode - T1 | TEI mode – non automat, TEI address -0<br>Excessive Ack. Delay T200 - 4000 |

| Issue | System Default Value | Comments |
|---|---|---|
| | Interface Type - Network<br>Signaling - CCS<br>Line Code - B8ZS<br>Frame Mode - ESF<br>Line Build Out - short_110-ft<br>Coding - u-law<br>LoopBack Mode - No_loopback<br>Clock Mode - Master | Idle Timer T203 – 10000<br>T302 timer – 4000<br>T309 timer – 0<br>T309 timer – 60000<br>D Channel Timeslot for Transmit/Receive - 24<br>B channels - 1-23 timeslots are enabled<br>Channels Selection – preferred<br>Channels Selection Ordering – descending<br>Bearer Establishment Procedure – on call acceptance<br>Called Party Type of Number and Calling Party Type of Number - unknown<br>Called Party Numbering Plan and Calling Party Numbering Plan – ISDN/telephony numbering plan<br>Route Incoming Call to - 00<br>Switch Type - primary_dss1<br>Incoming Called Digits Size - 1<br>Generate Progress Tone to IP – disabled<br>Generate Progress Tone to PSTN/PBX – disabled<br>Enable CLIR Service - disabled |
| Gain Control Settings | FXS lines:<br>Transmit Gain: - 6<br>Receive Gain: 0<br>E1/T1 Trunks:<br>Transmit Gain: 0<br>Receive Gain: 0 | |
| Call Routing | Route all incoming SIP calls to Call Routing – disabled<br>Route all incoming H323 calls to Call Routing - disabled<br>Local Routing table – no entries | Local AAA Table - no entries |
| RADIUS Settings | RADIUS client - disabled | |
| Dial Timeouts | 4 seconds | |
| User Management | 00 and 11 extensions exist<br>Display name for default 00 extension - Attendant<br>for 11 extension: no Display name, no Password<br>11 extension attached to the FXS lines 1,<br>SIP registration settings for all extension:<br>SIP server - sip.epygi.com<br>SIP Server port - 5060<br>Registration username and password - automatically generated<br>SIP Server Registration - enabled<br>SIP Settings sharing - disabled<br>SIP advanced settings – undefined, RTP Priority Level – medium<br>H323 - disabled | Call Relay - disabled<br>Codecs for Ext. 11: G726-32 (preferred), G711u, G711a, 729a, G726/16, G726/24 and G726/40<br>Codecs for Ext.24: G711u (preferred) and G711a<br>FAX - disabled,<br>Force Self Codecs Preference for Inbound Calls – disabled<br>Out of Band DTMF: enabled for all |
| 00 Attendant Settings | Attendant scenario - default<br>Welcome and Routing messages - default<br>Authorized phones – Undefined<br>Hold music – default | Attendant Codecs - G711u (preferred), G711a, G726/16, G726/24, G726/32, G726/40, G729a, G723, iLBC<br>FAX support - enabled,<br>Out of band transport – enabled,<br>Force Self Codecs Preference for Inbound Calls - disabled. |
| IP Routing Configuration | No Routes | |

# Appendix: Glossary

## A

**Asymmetric Digital Subscriber Line (ADSL)** - is a method for moving data over regular phone lines. An ADSL circuit is much faster than a regular phone connection, and the wires coming into the subscriber's premises are the same (copper) wires used for regular phone service. An ADSL circuit must be configured to connect two specific locations, similar to a leased line. A commonly discussed configuration of ADSL would allow a subscriber to receive data (download) at speeds of up to 1.544 Megabits per second, and to send (upload) data at speeds of 128 kilobits per second. Thus the 'Asymmetric' part of the acronym. Another commonly discussed configuration would be symmetrical: 384 kilobits per second in both directions. In theory ADSL allows download speeds of up to 9 megabits per second and upload speeds of up to 640 kilobits per second. ADSL is often discussed as an alternative to ISDN, allowing higher speeds in cases where the connection is always to the same place.

**Asynchronous Transfer Mode (ATM) -** a 53-byte cell-switching technology well suited for carrying voice, data, and video traffic on the same infrastructure. It is inherently scalable in throughput and was designed to provide Quality of Service (QoS).

**Auto Attendant (AA)** - a feature providing remote access to Quadro voice connectivity services. Specifically, it supports remote connection to Quadro extensions, to their mailboxes and for making calls to other destinations. Remote access to Quadro AA is possible through IP and PSTN calls.

**Auto Redial -** a service that allows automatically recalling the destination that was busy.

## C

**Call** - establishment of (or attempt to establish) a voice or data connection between two endpoints, or between two points that provide a partial link (e.g., a trunk) between two endpoints.

**Call Blocking -** a Quadro service that allows blocking unwanted incoming or outgoing calls over Quadro.

**Call Forwarding** - a Quadro service that allows transferring a call to another destination in case the Quadro user is busy, not answering or unconditional.

**Call Hold -** a Quadro service that allows holding the call in order to make another one, or to answer the second incoming call. The first call partner will listen to music while being on hold.

**Call Waiting** - a Quadro service that allows receiving a second call while being busy with the first one. The waiting party will hear a beeping during the conversation.

**Caller ID** - caller information is displayed on the called party's phone.

**Central Office (CO)** - a local switching system that connects lines to lines and lines to trunks. Sometimes used to refer to the building in which a switching system is located and the associated equipment. It is also the physical point where calls enter the long distance network.

**CODEC -** COmpression/DECompression that transforms analog voice into a digital bit stream and vice-versa. It is now an overall term for the technology used in digital audio and video.

## D

**D-channel -** In ISDN, the 16-kb/s segment of a 144-kb/s, full-duplex subscriber service channel that is subdivided into 2B+D channels, i.e., into two 64-kb/s clear channels and one 16-kb/s channel for the ISDN basic rate. **Note 1**: The D channel is usually used for out-of-band signaling. The two 64-kb/s clear channels are used for subscriber voice and data services. **Note 2**: The D-channel specifications are addressed in the CCITT Recommendation for the Integrated Services Digital Network (ISDN). **Note 3**: The D-channel may be 64 kb/s for the primary rate ISDN service.

**Data Encryption Standard (DES)** - a block cipher algorithm for encrypting (coding) data so it is nearly impossible for anyone without the decryption key to get the data back in unscrambled form. The DES standard enciphers and deciphers data using a 64-bit key.

**Dial peer** - an addressable call endpoint. In Voice over IP (VoIP), there are two types of dial peers: POTS and VoIP.

**Dial plan** - a description of the dialing arrangements for customer use on a network.

**Digital Signal Processor (DSP) -** A specialized microprocessor that performs calculations on digitized signals that were originally analog, and then forwards the results. The big advantage of DSPs lies in their programmability. DSPs can be used to compress voice signals to as little as 4,800 bps. DSPs are an integral part of all voice processing systems and fax machines.

**Digital Subscriber Line (DSL)** - public network technology that delivers high bandwidth over conventional copper wiring at limited distances. There are four types of DSL: ADSL, HDSL, SDSL, and VDSL. All are provisioned via modem pairs, with one modem located at a central office and the other at the customer site. Since most DSL technologies do not use the entire bandwidth of the twisted pair, there remains room for a voice channel.

**Distinctive Ringing** - Quadro service that allows a specific ringing pattern assignment for particular callers over Quadro.

**Domain -** a place on the Internet you can visit with your browser, i.e., a www site. It also might be a single computer or computers masqueraded as a single computer. On the Internet, the domain is the address that gets you there.

**Domain name -** in a network using the TCP/IP, the full domain name consists of a sequence of names (labels) separated by periods (dots), for example, Quadro.epygi.com.

**Domain Name System (DNS)** - a system used on the Internet for translating names of network nodes into their addresses.

**Downstream -** in communications, there are two circuits. One coming toward you and the other going away from you. Downstream is another term for the transmission coming toward you.

**Dual-Tone Multifrequency (DTMF) -** a method of signaling consisting of a push-button or touch tone dial that sends out a sound consisting of two discrete tones that are picked up and interpreted by telephone switches (either PBXs or central offices).

**Dynamic Host Configuration Protocol (DHCP)** - a network standard regulating the IP address and other information assogned to the clients by the server.

**Dynamic Host Control Protocol (DHCP)** - a protocol that is used to dynamically allocate and assign IP addresses. DHCP allows you to move network devices from one subnet to another without administrative attention.

## E

**E1** - wide area network digital transmission scheme. E1 is the European equivalent of a T1 line. The E1's higher clock rate (2.048 MHz) allows for 32 separate 64Kbps channels, which include one channel for framing and one channel for D-channel information.

**Ethernet -** a localarea network used for connecting computers, printers, workstations, terminals, servers, etc., within the same building or campus. Ethernet operates over twisted pair and/or over coaxial cable at speed up to 10Mbps.

**Ethernet Controller** - the unit that connects a device to the Ethernet cable.

**Ethernet Switch -** the device that connects local area networks.

**Extensions** - users over Quadro.

**External User** - users connecting Quadro by IP or PSTN calls.

## F

**Firewall** - a combination of hardware and software that limits the exposure of a computer or group of computers to an attack from outside. A firewall is a system or combination of systems that enforce a boundary between two or more networks. One purpose of an Internet firewall is to provide a single point of entry where a defense can be implemented, allowing access to the Internet resources from within the organization, and providing controlled access from the internet to hosts inside the organization's internal networks.

**Firmware -** is computer or OS required software that resides on ROM

**Foreign Exchange (FX) -** a Central Office trunk that has access to a distant Central Office. A dial tone is returned from that distant Central Office and a location can be reached in the area of the foreign Central Office by dialing a local number.

**Foreign Exchange Office (FXO)** - a service that can be ordered from the telephone company that provides local telephone service from a central office that is outside (foreign to) the subscriber's exchange area. To generate a call from the computer telephony system to the POTS set, you will need a FXS connection configured. See also FXS.

**Foreign Exchange Station (FXS)** - Interface that connects directly to a standard telephone, fax machine, or similar device over a standard RJ-11 modular telephone cable, and supplies ringing voltage, dial tone, and similar signals to it. see FXO

**Framing** - A procedure for controlling errors. Consists of inserting bits so the receiver can identify the time slots allocated to each subchannel

## G

**Gatekeeper -** is the central control entity that performs management functions in a Voice and Fax over IP network and for multimedia applications such as video conferencing. Gatekeepers provide intelligence for the network, including address resolution, authorization, and authentication services, the logging of call detail records, and communications with network management systems. Gatekeepers also monitor the network for engineering purposes as well as real-time network management and load balancing, controling bandwidth, and providing interfaces to existing legacy systems.

**Gateway -** an entrance into and out from a communications network. Technically, a gateway is an electronic repeater that intercepts and steers electrical signals from one network to another.

**Greeting** - voice messages that are played to the Quadro users or users calling to the Quadro activating specific services.

## H

**Hold Music** - music played to the party that is on hold.

**Host -** an intelligent device attached to the network; can be also a mainframe computer.

**Host Name -** the name given to a mainframe computer or device.

**Hunt Grouping -** the Quadro service that allows configuring several users over Quadro to ring in series when a specific call arrives.

**Hypertext Transfer Protocol (HTTP)** - the protocol used by Web browsers and Web servers to transfer files, such as text and graphics files.

## I

**Integrated Services Digital Network (ISDN) -** is a system of digital phone connections which allows voice and data to be transmitted simultaneously across the world using end-to-end digital connectivity. There are two basic types of ISDN service: Basic Rate Interface (BRI) and

Primary Rate Interface (PRI). BRI is a basic service is intended to meet the needs of most individual users. PRI is intended for users with greater capacity requirements

**Internet Control Message Protocol (ICMP)** - a network-layer Internet protocol that reports errors and provides other information relevant to IP packet processing.

**Internet Protocol (IP) -** a unique, 32-bit number for a specific TCP/IP host on the Internet, normally printed in decimal form (for example, 128.122.40.227). Part of the TCP/IP family of protocols, it describes the software that tracks the Internet address of nodes, routes outgoing messages, and recognizes incoming messages.

**Internet Service Provider (ISP) -** a vendor who provides direct access to the Internet or a company that provides Internet access to other companies and individuals.

**Intrusion Detection System (IDS)** - is a firewall, but together with deleting the dangerous packets or packets including intrusion attacks, IDS also keeps information about dropped packets and the senders responsible for them.

**IP address** - also known as the Internet Address, is a unique 32-bit identifier for a specific TCP/IP host computer on a network. IP addresses are in dotted decimal form, such as 192.168.10.26, with each of the four address fields assigned as many as 255 values.

**IP address Mask -** A range of IP addresses defined so that only machines with IP addresses within the range are allowed access to an internet service. To mask a portion of the IP address, replace it with the asterisk wild card character (*). For example, 192.44.*.* represents every computer on the internet with an IP address beginning with 192.44

**IP Gatekeeper -** defines the policies that govern a multimedia system such as dialing plans, user privileges, bandwidth consumption, and others. The gatekeeper also provides the means to extract information from such a system for various purposes, e.g., billing information, users that are logged in, etc. The gatekeeper is also a focal point for the introduction of supplementary services.

**IP Gateway -** most commonly, a network device that converts voice and fax calls, in real time, between the public switched telephone network (PSTN) and an IP network. The main IP gateway functions include voice, fax, compression/decompression, packetization, call routing, and control signaling. Additional features may include interfaces to external controllers, such as gatekeepers or soft-switches, billing systems, and network management systems.

**IP PBX -** an enterprise-based IP data network device that switches VoIP telephone traffic.

**IP Telephony -** a technology that allows voice phone calls to be made over the Internet or other packet networks using a PC via gateways and standard telephones.

**IPSec** - is used to provide security for transmission of sensitive information over unprotected networks such as the Internet. IPSec acts at the network layer, protecting and authenticating IP packets between participating IPSec devices ("peers"), such as Cisco routers.

## J

**Jitter Buffer** - the buffer that collects incoming packets to place them in the right order. If the network has a high delay variation, increasing the Jitter Buffer can improve the audio quality, but this also increases the delay.

## L

**LED** - Light-Emitting Diode, A semiconductor device that emits visible light when conducting current. Has replaced incandescent lamps as indicators in most electronic equipment.

**Lifeline POTS -** a voice telephone line that works even if electricity is cut off at the customer premises, since the line is powered from emergency backup at the central office. Multiple lifeline POTS lines can be delivered on one copper pair with the use of a digital line powered pair gain system. A basic telephone service supplying standard single line telephones, telephone lines, and access to the PSTN.

**Local Area Network (LAN)** - a short distance data communications network (typically within a building or campus) used to link computers and peripheral devices under some form of standard control.

**Login** -the procedure of identifying a user with a username and a password to enter into the protected field.

## M

**Many Extensions Ringing** - a Quadro service that allows configuring several users over Quadro to ring simultaneously when a specific call arrives.

**Media Access Control (MAC) Address** - the address for a device as it is identified at the Media Access Control layer in the network architecture.

**Media Access Control (MAC) Layer** - is one of two sublayers that make up the Data Link Layer of the OSI model. The MAC layer is responsible for moving data packets to and from one Network Interface Card (NIC) to another across a shared channel.

**Media Gateway -** a generic class of products grouped under the Media Gateway Control Protocol (MGCP). A major function of the media gateway is simple IP/TDM conversion under the control of a softswitch.

## N

**Name server -** a directory service that provides a mapping between a resource's global name and its physical location in the network.

**Network Address Translation (NAT) -** is used to allow LAN devices that do not have their own static IP addresses to connect to the Internet sharing an IP address. NAT will assume control of assigning their IP address. Furthermore, the NAT takes care that packets will reach the LAN PC that originated the traffic. This mechanism is absolutely transparent for the users (or the PCs in the LAN).

**Network Time Protocol (NTP)** - a protocol that is used for time counting in the Internet, based on the atomic clocks with the precision in milliseconds. This is the recommended protocol for synchronizing the time of hosts in the network.

## P

**Packetization Interval** - the time interval between two RTP packets of the same stream. If the interval is increased, the overhead is decreased but the voice quality might deteriorate. If the interval is decreased, the network load is increased and the delay is reduced.

**Password** - a secret alphanumeric string used to identify and to allow the user to have access to a system.

**PCM** - a form of modulation in which the information signals are sampled at regular intervals and a series of pulses in coded form are transmitted representing the amplitude of the information signal at that time.

**Point-to-Point Protocol (PPP)** - allows a computer to connect to the Internet with a standard dial-up telephone line and a high-speed modem and to enjoy most of the benefits of the direct connection.

**Point-to-Point Tunneling Protocol (PPTP) -** enables virtual private networking - enabling secure remote access to corporate networks over the Internet.

**POTS (Plain Old Telephone Service)** - is the standard telephone service that most homes use. It is also referred to as the PSTN, or the Public Switched Telephone Network

**Private Branch Exchange (PBX) -** a telephone switch owned privately, usually by a large company. If it owns a PBX, a company does not need to lease a telephone line for each telephone set at a site.

**Proxy server** - an intermediate device that receives SIP requests from a client and then initiates requests on the client's behalf.

**Public Switched Telephone Network (PSTN)** - refers to the local telephone company.

## R

**Real-Time Transport Protocol (RTP) -** the Internet-standard protocol for the transport of real-time data, including audio and video, allows applications to synchronize audio and video information. RTP connections are established between servers across the Internet after voice has been converted to IP format. RTP is used in virtually all Voice-over-IP architectures, for videoconferencing, media-on-demand, and other applications.

**Real-Time Transport Control Protocol** (RTCP**)** - is the control protocol that works in conjunction with RTP. RTCP control packets are periodically transmitted by each participant in an RTP session to all other participants. Feedback of information to the application can be used to control performance and for diagnostic purposes.

**Registration** - procedure of user subscribing to a server. Usually some personal parameters such as username, password, etc., are required upon registration.

**Remote Testing** - remote connection from the Epygi Support office to the customer's Quadro for testing and/or for troubleshooting.

**Router -** A device that determines the next network point to which a data packet should be forwarded enroute toward its destination. The router is connected to at least two networks and determines which way to send each data packet based on its current understanding of the state of the networks it is connected to. Routers create or maintain a table of the available routes and use this information to determine the best route for a given data packet

**RSA -** is an asymmetric key system. It must be available on both sides of the VPN and generates on each side a different pair of keys, a private and a public key.

## S

**Security Parameter Index (SPI) -** is an index to keep VPN tunnels distinct. A security association is defined by destination, protocol and SPI. Without the SPI, connections to the same gateway using the same protocol would not be distinguishable.

**Session Initiation Protocol (SIP) -** is an application-layer control protocol that can establish, modify and terminate multimedia sessions or calls. SIP is increasingly used for Internet telephony signaling, in gateways, PC phones, softswitches, and softphones, but it is not limited to Internet telephony, and can be used to initiate and manage any type of session, including video, interactive games, and text chat.

**Signaling** - a process of sending a transmission signal over a physical medium for communication.

**Silence Suppression** - a method that allows disabling RTP packet transmission when there is no voice activity. This feature helps to avoid extra traffic when the RTP stream doesn't contains voice data.

**Simple Network Management Protocol (SNTP)** - the Internet standard protocol developed to manage nodes on an IP network.

**SIP address** - unique address of the users registered on the SIP server. The address can be used to connect the user. The full SIP address has the following format: "display name" <username@ipaddress:port>.

**SIP server** - this server is used for registering users. It gives a possibility to make IP connections between users registered on the same SIP server.

**Software** - PC programs.

**Software PBX** - a telephone system that converges voice and data on an industry-standard computing platform and uses computer telephony components that conform to industry standards. Since they conform to industry standards, software PBXs are interoperable with third-party systems and CT components. Conformance also allows software PBXs to run third-party enhanced applications such as desktop call control, graphical voice mail, automatic call distribution (ACD), IP gateways, follow-me call forwarding, unified messaging, and CRM integration.

**Speed Calling** - a service that allows making a personal address book for every Quadro user. A simple digit combination can be assigned to any destination phone number.

## T

**Transfer** - a service giving a possibility to readdress incoming calls. Call Transfer can be conditional (with consultation) and unconditional (without consultation).

**Transmission Control Protocol (TCP)** - a connection-oriented transport layer protocol that provides reliable full-duplex data transmission. TCP is part of the TCP/IP protocol stack.

**Transmission Control Protocol/Internet Protocol (TCP/IP) -** is a networking protocol that provides communication across interconnected networks, between computers with diverse hardware architectures and various operating systems.

**Trunk: -** is a communications channel between two points, typically referring to large-bandwidth telephone channels between switching centers that handle many simultaneous voice and data signals.

**Trunk Level 1 (T1)** - a high-speed (1.544Mb/s) digital telephone line with the equivalent of 24 individual 64Kb/s channels that are joined via time division multiplexing. A T1 line can be used to transmit voice or data, and many are used to provide connections to the Internet. T1 is the North American equivalent of an E1 line.

## U

**UDP** - a connectionless transport layer protocol in the TCP/IP protocol stack. UDP is a simple protocol that exchanges datagram without acknowledgments or guaranteed delivery, requiring that error processing and retransmission be handled by other protocols.

**Universal Serial Bus (USB)** - is an interface with a protocol that is designed to handle a broad range of devices - telephones, modems, printers, etc.

**Upstream-** in communications, there are two circuits - one coming toward you and the other going away from you. Upstream is another term for the name of the channel going away from you.

**URL** - an identifier used to locate content that is transported via the HTTP protocol.

**Username** - identification name of the user. Usually used for registration and login.

## V

**VCI** - parameter used to configure ATM settings and is usually given by the Internet provider.

**Virtual Private Network (VPN)** - connects two local networks (intranets) over the insecure Internet securely. VPN routers manage authentication between servers and clients and handle data encryption for the connection. Only authorized users can access the network and the data exchange cannot be intercepted. A VPN includes authentication and encryption to protect data integrity and confidentiality. VPNs are “virtual” in the sense that individuals can use the public Internet as a means of securely accessing an internal network. Once the VPN connection is established, users have access to the same network resources, addresses, and so forth as if they were connected locally. VPNs are “private” because the data is encrypted between two VPN gateways. Encryption makes it very difficult for anyone to intercept data and capture sensitive information such as passwords.

**Voice mail** - a brief message that external users can leave for the Quadro users in the event that nobody answers the call.

**Voice Mail System (VMS)** - a feature providing the possibility of leaving brief voice messages at the unavailable or busy Quadro extension’s mailbox.

**Voice mailbox** -is the mailbox where voice mails are collected.

**Voice message -** help messages that are played to the user giving a hint on how to manipulate the menus within Quadro using the phone handset.

**Voice Over Internet Protocol (VOIP) -** technology used to transmit voice conversations over a data network using the Internet Protocol. The ability to carry normal telephony-style voice over an IP-based internet with POTS-like functionality, reliability, and voice quality.

**VPI** - parameter used to configure ATM settings usually given by the Internet provider.

## W

**Wide Area Network (WAN) -** a communications network used to connect computers and other devices across a large area.

**Windows Internet Naming Service (WINS)** - a database with all PC hostnames and IP addresses connected to them in the TCP/IP environment.

# Appendix: Software License Agreement

**EPYGI TECHNOLOGIES, LTD.**
**Software License Agreement**

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**13.** **Governing Law.** This Agreement shall be governed by and construed in accordance with the laws of the state of Texas, without regard to choice of law provisions that would cause the application of the law of another jurisdiction.

**14.** **Attorneys' Fees.** In the event of any litigation or other dispute arising as a result of or by reason of this Agreement, the prevailing party in any such litigation or other dispute shall be entitled to, in addition to any other damages assessed, its reasonable attorneys' fees, and all other costs and expenses incurred in connection with settling or resolving such dispute.

If you have any questions about this Agreement, please write to Epygi at 6900 North Dallas Parkway, Suite 850, Plano, Texas 75024 or call Epygi at (972) 692-1166.